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H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary
H. D. FARGO, Jr., Vice-President and Advertising Manager
D. C. SORENSEN, Western Advertising Manager

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How a "Buy Now" Policy Will Help the Telephone Industry

All business leaders who have done any constructive thinking on the subject agree that what this country most needs to start the climb back to good times is increasing public confidence that better times are sure to return. That belief lies in the back of everybody's mind, for nobody is willing to admit that the United States is a failure and will never recover its prosperity.

* * * *

The trouble seems to be that this belief is too far "back" just now, and a majority are waiting for the sun to burst out suddenly before they make a move to be ready for the recovery.

Picture a heavily-loaded wagon stuck hub-deep in the muddy rut of a road such as used to run through Illinois in the days before taxes built the hard roads. Given plenty of time, the sun would eventually dry up the mud and the team could pull out; but if all the neighbors came to the rescue and helped push, the wagon was soon heaved out of the mire and proceeded on its way.

And that is precisely what the neighbors used to do back in the days when people were accustomed to hardships and overcoming obstacles.

Cooperation overcame the obstacles.

* * * *

That is what is needed today—more cooperation. The telephone industry is no exception. In fact, the telephone industry—especially in the Independent group—owes its progress chiefly to close cooperation between its operating companies and its various manufacturers and supply dealers.

Today that cooperation is suspended by the failure of operating companies to make normal purchases for repairs, replacements and extensions. Strong efforts should be made to end this situation and encourage more buying. It is to the interest of all branches of the telephone business that service companies stop "hoarding" orders and send them into the factories without further loss of time.

* * * *

The March bulletin of the Illinois Telephone Association devotes considerable space to this important matter, saying:

"Telephone manufacturers are having a tough time of it because telephone companies are making no extensions and some companies are doing little repair and replacement work. One of the manufacturers writes that their business is down to 20 per cent of normal. He says further:

'There are a great many companies who could unquestionably do a lot of rebuilding now to bring their plants up to the point where they are not liable to have subscribers complain to the commission and then have the commission jump on them with two feet to not only rebuild their plants, but reduce their rates, as well.'

The manufacturing and supply business is undoubtedly a very necessary part of the industry and it would be a serious condition if, as in one instance in our recollection, a telephone company had to take over a factory in order to get equipment for replacements and extensions to its facilities.

One of the most noted economists has repeatedly said that there is plenty of money in the country and instead of inflation, the way out of our troubles is by way of more rapid circulation.

Many of the telephone companies are accumulating funds, as a result of charges to maintenance for depreciation, that could be used to excellent advantage at this time in improving service, thus helping the public, the telephone company and the manufacturer."

* * * *

In another section of his bulletin, Secretary A. J. Parsons also quotes from Telephony's editorial of February 25, which urged operating companies to adopt the "Buy Now" policy and help manufacturers to tide over the present difficult period and maintain their organizations.

The point was made that a 15 per cent increase in buying by service companies would be a big help to manufacturing concerns and enable them to keep in service the men who for many years have called on and served the operating field.

* * * *

Both the United States Independent Telephone Association and the various state telephone organizations are keenly alive to the importance of this condition, and feel that operating companies should make their purchases within the next 60 days.

It is admitted that a vast amount of maintenance work has been delayed during the past year. The telephone associations have been urging companies in recent years to set up and maintain adequate depreciation reserves, and now feel the necessity of these funds being utilized for the purposes which called for their establishment.

* * * *

Several good results will follow. For instance, reasonable buying will benefit the manufacturers and supply dealers on whom the service companies must depend for equipment. Proper replacements and repairs, also, will keep telephone service up to a desirable standard and improve the company relations with its patrons. It is important that plants be kept in efficient condition.

Furthermore, the use of depreciation reserves will prove that the company is keeping faith with its customers, and not collecting that portion of the rate simply to increase its revenues.

The latter consideration is vitally important, and will become more so if regulatory commissions raise the point: "If a service company does not utilize depreciation reserve for the intended purpose, rates should be reduced accordingly."

* * * *

No direct blame is to be attached to operating companies that have conserved their cash and kept close to shore in the matter of expenditures. This is the natural course to pursue in times of financial stress. Everybody has tried to curtail expenses—even to the point of doing without things that are actually needed. At the same time, this policy has been a big factor in slowing up all business operations and deferring recovery.

Too many people have "cut down" to a dangerous extreme. Fear has led them to practice an economy that was out of all proportion to the necessity of their situation. This mistaken policy has cost telephone companies many subscribers. Of late there has been a distinct modification of this exhibition of general fear and buying panic, and this is being pointed out as a hopeful sign of returning confidence.

* * * *

Telephone companies can contribute their share to the desired business pick-up by sending in their orders for needed equipment and supplies and planning for the usual spring rebuilding program. It will help their manufacturers and, in no less degree, it will help their own business.

COMING CONVENTIONS.

South Dakota Telephone Association, Hotel Widman, Mitchell, April 5.

Kansas Telephone Association, Sunflower Hotel, Abilene, April 13 and 14.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 18 and 19.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 23, 24 and 25.

United States Independent Telephone Association, Tower Room, Hotel Stevens, Chicago, Ill., July 11, 12, 13 and 14.

Our Mind and Our Business Today

Changing World and Existing Conditions Accentuate Need for Aggressive Selling—Telephone Values and Selling Suggestions Compared With Various Courses of a Meal—Address Before Traffic Conference of Illinois Convention

By Abbot D. Spaulding,

Division Traffic Supervisor, Illinois Bell Telephone Co., Chicago

The family income of today is spent largely for those things that go to preserve and sustain life, that add to the comfort and enjoyment of life, and that preserve and maintain organized society. Telephone service contributes to all of these things.

This being true you might properly ask: "If we are so well established as an agency meeting consumer demand, why do we have to worry about it?" That is just it; nothing is ever too firmly established in a changing world, and existing conditions have accentuated rather than lessened the need for an aggressive, alert attitude to maintain or improve our position.

Whenever the telephone industry has had major problems to meet in the past it has met and overcome them through the cooperation and help of its employes. Today the industry is adopting the same tactics. Through your help, my help and our help, we hope to win through to the time when these problems will no longer appear so pressing as they are today.

Before discussing the means available for assisting in this work, let us consider how all-important is our attitude in regard to these problems. By attitude in this connection, I mean the state of our minds.

We have all had our moments of fear, suspicion, distrust and lack of confidence. These mental impressions, sweeping through the minds of millions of people throughout the past few years, have had much to do with the present deplorable economic conditions. What we need now is the opposite of these destroying mental influences. We need a rebirth of confidence, faith, hope and good cheer. These positive, constructive mental forces must be born in the minds of the individual.

What of your confidence, your faith, your hopes and your attitude of good cheer? You thus come directly into the picture, for the sum of your individual attitudes will become the attitude of the group.

Confidence is essential to your individual progress; faith is necessary for your individual betterment; hope is a guide to your individual future course of action; a cheerful manner and a cheerful outlook control all other influences. They are like the gentle fall of rain to the countryside, blessing all upon whom they fall.

If you would stand out from the throng; if you would be welcome wherever you go; if you would live a fuller life, getting more out of everyday life; if you would be remembered as having been among us—be cheerful. A poet has summed it all up in two sentences:

"All sides bespeak of gloom, lost hope and sorrow
But in my mind lives a better, brighter tomorrow."

To apply these teachings to our everyday existence as telephone employes is easy. We in the central office operating rooms, have the greater need and the more direct use for this philosophy of action. To the operators, supervisors and chief operators the need shapes itself as a daily necessity.

In times of stress and depression our customers are more critical and touchy than in normal times. It is part of our responsibility to recognize this and so to render our service and conduct our dealings with our subscribers that their opportunities for finding fault will be reduced to an absolute minimum.

Fast, accurate, courteous and cheerful telephone service, flowing over our switchboards all the time, will do much toward keeping telephones in service, promoting public acceptance of our rate schedules and preserving the good opinion of the public toward our industry. All contacts which supervisors and chief operators have with subscribers regarding service criticisms or service suggestions should be treated with even greater consideration and in a manner more satisfactory to the subscriber than may be required in normal times.

Do not misunderstand me; a service criticism must at all times receive the best handling available, but today these criticisms should be more carefully watched and corrections made so that the subscriber feels that his telephone service of today, instead of adding to his burdens, is rather an instrumentality always ready to serve him and his interests.

Now for a brief glance at, or in, an operating room of today: We have good, efficient and willing workers; we have high-grade, adequate equipment; we have pleasant, well-lighted, well-ventilated places in which to work. What else do we need?

We need a cheerful, hopeful attitude throughout all of our forces, including the supervisory. Drop a cheerful person into a gloomy group, a cheerful word into a sad array of spoken thought, a cheerful outlook into a sea of pessimism, and it is like touching a match to a field of dried grass: you soon have a prairie fire sweeping across the land before the winds of hope and confidence.

A cheerful outlook among our operating forces will provide better telephone service. Cheerful supervision by supervisors and chief operators will permeate the force and influence all with whom they come in contact. Cheerful operators will radiate cheer to their fellow workers and this in turn will spread through to the subscribers' service.

Probably all telephone companies have suffered a drop in revenues. Most of them have met the decline through some cut in operating expense but it is safe to say that few, if any, may have been able to reduce expenses sufficiently to meet the decline in revenue. Knowing this, you can see the need for explaining your company's position whenever you have the opportunity, for it is only through disseminating correct information that we can bring the public to an appreciation of our position.

In order to regain lost business and lost revenue or to keep them to a minimum, most companies have adopted some system of organized selling. Many companies have enlisted the help of their employes in selling. Some have their employes selling all the year round, while others put on special sales campaigns. Regardless of the plan your company may be following, it is worthwhile for us to consider some of the many phases of this newest development in our business.

The purpose, of course, is to regain, to hold or to increase our business. The value of the effort is measurable in terms of employe and company benefits. Its methods are various and cover a wide field.

The primary value of this work, both to the company and to the employe, has a dollar and cents value. In addition to this

Mr. Spaulding Stresses the Importance of Cheerfulness and a Feeling of Confidence Among Telephone Employes. In Summing Up His Message Concerning Organized Selling by Employes He Declared That "It Can be Done. . . . In Order to Sell, You Must Believe You Can Sell."

value, the company will benefit in improved public relations if the selling is properly done and is solely designed to increase the value of telephone service to the subscriber.

The employe who participates in the effort will benefit, first, by enlarged knowledge of the business; second, by improved understanding of the business; and third, he will become a better employe.

I want to make this statement and I hope each of you will understand it clearly:

If each of you and all of you will enter this activity wholeheartedly, gaining an adequate understanding of its purpose and a thorough knowledge of its methods and will participate actively all of the time, you will get out of it much more than you put into it.

This is a broad statement but one subject to proof, and the proof of the pudding is in the eating; so draw up a chair, sit here at my right, at my left and across the table, as I serve to you the 1933 version of an employes' sales meal.

On the cover of my menu card you read the policy of our business—"the most telephone service and the best at the least cost to the public." Next come the appetizers, those things that are designed to increase and sharpen our appetites. My meal offers you variety here: personal pride, needed ambition, pride of achievement, satisfaction, thirst for knowledge and effort.

Selling telephone service is not fundamentally difficult. It is a fascinating, interesting opportunity for you to improve yourself. If you think you know it all, it will help you to realize that you are mistaken. If you know little, it will help you to increase your knowledge. If you think you know people, it will teach you otherwise. If you do not know people, it will help you to understand them.

If you like to talk, you will learn to talk to better advantage and to express yourself better. If you dislike talking, you will come to know the great need for it and realize that you have missed out on something. If you are bold, you will need your courage. If you are timid, you will realize your disadvantage and fight to overcome it. If you like a game that is keen, you will like selling, for it is the highest form of competition.

Now for the next course: Before all else, you must know what your company has to sell in the way of service and extra services. You must be able to answer many questions regarding them. The more common forms of telephone service include individual business lines, individual residence lines, party-line service, rural service, extensions, handsets and directory listings.

The first essential to the sales job is alertness to opportunity to sell service. Everybody you meet, every person you know, every individual with whom you come into contact is a suspect for telephone service, although every suspect is not necessarily a prospect.

Suspects pass out of the picture if they have not the means to pay for service, if they have no use for the service, if they already have adequate, comfortable and convenient service commensurate with their ability to pay for it. The remaining suspects became prospects, and further consideration and analysis develop the facts which enable you to list them as:

First, questionable prospects or those who appear doubtful but who should be questioned to make sure; second, reasonably-sure prospects, those who have average reasons for needing additional service, additional facilities or new service, but with whom the selling job becomes one of persuasion and fitting the needs to the prospect's viewpoint; third, favorable prospects but hard to sell, that is, those who have a real need but who must be persuaded of their need by intensive salesmanship; fourth, favorable prospects—easy to sell.

These last are the cream of the crop, but a good selling job on values and uses

of the service wins lasting, loyal subscribers.

Circumstances may make our sales job harder or easier. For example, a former subscriber who has discontinued his service is usually easier to sell than one who has never had service. A subscriber who now has service but is a prospect for an extension or handset, must be sold entirely on the advantages of those additions or changes rather than on the service as a whole, because his present arrangement may appear to him to be ample.

Now comes the next course: the entree, the main part of the meal. This course—the most important one of the selling feast—consists of the following reasons and arguments:

The telephone is a necessity in business and in the home. More business is obtained over the telephone than by any other means of distant communication. The telephone is the most efficient agency for intercommunication and saves more time and money than any similar instrumentality. It is the speediest messenger and the greatest saver of time ever devised. It brings the outside world or your neighborhood to your door, even to your fireside. It keeps you in touch with relatives, friends, neighbors and events.

It never sleeps; it serves 24 hours of every day of every year. It guards the family, the home and is like the magic wand of fairy tales. No home is complete without it.

Telephone service costs less than any other necessity measured in terms of value of service. For a few cents a day or a few cents a call it saves lives, saves property, saves time, gets business, aids the flow of commerce, strengthens the social life of the nation and adds to the comfort and pleasure of living.

It makes the entire world a neighborhood. It bridges geographical boundaries, hills, valleys, countrysides, rivers, mountains, lakes and oceans. It conquers land, sea, air and space. It serves the store, the factory, the shop, the home, the hotel, the government, the individual, the airplane in flight and the ship at sea.

It brings together hope and lost hope, fear and confidence, joy and sorrow, love and those that are loved. It serves my voice, your voice, all other voices; it serves my purpose, your purpose and all other human purposes.

Many businesses pride themselves on serving the public and their customers. To such businesses the telephone is not only a necessity but sufficient facilities must be provided to handle their calls adequately. Information about sales, about prices, about deliveries must be provided by stores; information about the arrival and departure of trains, about costs, about routes and about excursions must be provided by railroads; information about local happenings, national events, deliveries and news must be provided by newspapers, etc.

In the home the telephone becomes a convenience in meeting the needs of the family economically. It arranges for all forms of social activity, takes care of errands, shops for you, checks delayed arrivals, and saves energy for the busy housewife and for the husband and children.

Thus, we see as we get into the meat of this subject of employe sales that selling becomes a matter of telling our story of values for, after all, value received is what makes each customer satisfied or dissatisfied with his purchase.

Now for the side dishes—the vegetables as it were. We cannot eat of the meat alone if we would have a balanced meal. Our side dishes consist primarily of knowing "How to Sell and What to Do About It."

There is no magic about this work. There are no secret recipes; no secret concoctions of which you may partake heartily and, presto, become high-grade telephone sales employes. The beauty of it is that it is simple and that each of you can achieve success. All that it takes is to see the need for it, desire to do it, then do it and keep on doing it.

My message may be summed up when I say "it can be done." Here is where the mind factor comes back into the discussion of our business today. Your mind will loom large as the most important asset or obstacle to your progress in this work.

The most destructive force in your individual life is to believe that a thing cannot be done. These words have been the cause of more failures than any other philosophy of life. So in order to sell, you must believe you can sell. With this background, all you need is to try. Direct your efforts along the following lines:

Be sure that you can talk, that you can see and that you can hear. Know your background. Study your nearest field of action. Make a list of individual prospects and try to fit your understanding of what they may need in telephone service to your knowledge of what they have.

Study the advantages of your plan. Review your sales appeal. Tackle the prospect at an opportune time. Tell your story, always alert to take advantage of something the prospect himself may say. Meet all objections or turn them all in your own favor. Bring the prospect to a decision.

By this time you are thinking to yourself: "It's easy enough for him to talk about it. I didn't do all that and I made many sales. I could not possibly do all that. I'll find a simpler plan."

My answer is: Perhaps you are right, but we all have to begin; we all want to make the best use of our efforts and do better than we are doing. I do not care what methods you use, but *you* should care. It does not matter to me what your results are, but *you* should care. The other fellow's experience is a good teacher; and if you would succeed to the fullest extent of your capabilities in employe selling work, you will have to remain open-minded and check your mistakes constantly in order not to repeat them.

If you do not sell your first prospect, what do you do? You study the objections raised that you were unable to meet, that lost the sale. You determine now how to meet those objections in future interviews.

Thus, from prospect to prospect you broaden your knowledge, your experience and your ability to express yourself so that after a time, before you are aware of it, you will really be selling service. Then you can broaden your field of action and sell in all directions with an all-seeing eye and far-hearing ear attuned to catch the first faint tingle or the first vague glimpse of a distant sale.

Our meal has progressed course by course until we have reached the salad. Our salad consists of certain hints that will help you in selling. For instance, never call a janitor a janitor—call him the building superintendent; do not use technical terms in talking to a prospect; always sell down—do not sell up from the lowest grade services to the highest; do not quote prices until you have covered the entire sales story; then quote from the highest price down, not from the lowest up. It is also well to quote on the basis of a few cents per day or week.

Now we come to the dessert, which is a sort of reward for having sat through such a big meal. Remember what I said as to what telephone selling will do for you individually. Each of you will reap a reward that will improve your personality, your poise, your manner of expression, your means of expression. You will build up and add to your store of confidence, of enthusiasm, of hope, of energy and good cheer.

You cannot afford to miss this experience. You must build, must work, must live to enjoy the fruits of labor well done. You will be helping your company, your industry and yourself out of the difficult times of the present into the sunlight of better times, more work and happier hours and days.

In closing, hear me well: Our business today is not in the lap of the gods, but in my lap, your lap, our laps.

Start Now to Get Ahead.

The way to get ahead is to start now. If you start now, you will know a lot next year that you don't know now and that you would not have known next year if you had waited.—William Feather.

An Improved Bridge for Toll Test Boards

Location of High Resistance Faults Requires Highly-Insulated Wheatstone Bridge and Sensitive Galvanometer—Precision Type Equipment in New Bridge Unit and Associated Equipment as Described in Bell Laboratories Record

By A. J. Pascarella,
Member of Technical Staff, Bell Telephone Laboratories, Inc.

In maintaining high grade communication service over long toll lines, it is necessary to discover faults, such as leakages to ground or high resistance contacts, before they have become serious enough to disturb conversations or programs being transmitted, and to locate them accurately and quickly so that they may be promptly removed.

In general, some form of "bridge" measurement is required, and the accuracy with which the fault may be located depends on the precision of the resistances of the bridge, on the sensitivity of the galvanometer, on the insulation of the testing equipment, and on the conditions of the line.

A low resistance ground or short circuit is easily located within a very short distance if good cable records are available, but a high resistance fault, such as occurs when moisture first begins to enter a cable, requires very accurate tests for its location.

For the location of insulation faults up to about 100,000 ohms, a bridge of average insulation and sensitivity may be sufficient, but for locating faults with resistances of the order of several megohms a more highly insulated bridge and a more sensitive galvanometer are required. To meet the requirements for this type of measurement, the Bell Laboratories have recently developed a new bridge unit and associated testing equipment.

In addition to the facilities for locating high-resistance faults, this bridge provides a number of improved features which are advantageous for other types of fault-location measurements. It may be employed as required in place of the earlier type bridge in the No. 5 toll test board.

The increased accuracy and range of the new bridge is secured by employing precision type equipment and adapting it for use in a standard toll test board section. An 85 cm. light beam from the galvanometer is employed instead of the 20 cm. beam formerly used.

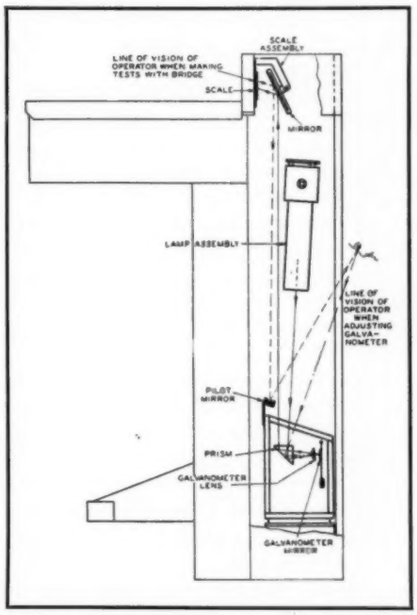


Fig. 3. Sensitivity of the Wheatstone Bridge Is Increased by Mounting Galvanometer In the Lower Part of the Section, Which Permits a Light Beam More Than Four Times Longer Than That of the Earlier Equipment.

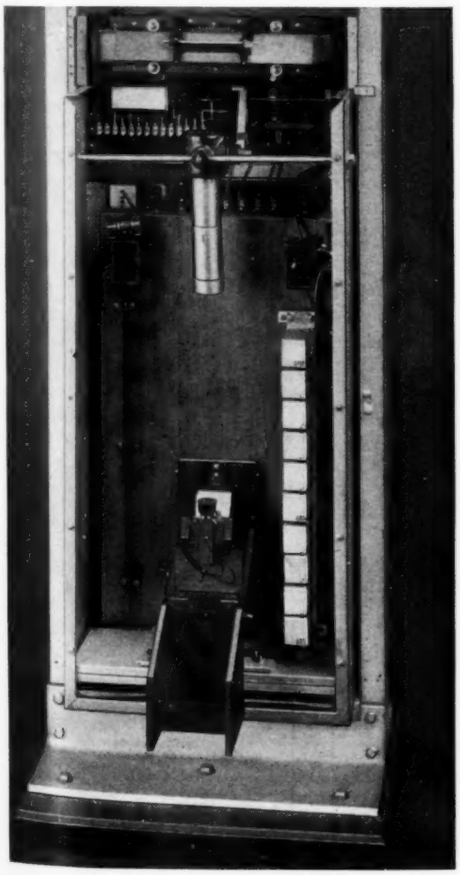


Fig. 1. Exposed View of Rear of Bridge Section Showing Lamp Unit and Galvanometer. Fig. 2. Front View, With Front Panel and Foot Rail Removed, Showing the Associated Battery Consisting of 12 22½-Volt Units, Behind Which Is Located the Galvanometer.

This greater distance is obtained by mounting the galvanometer in the lower part of the frame and, by a suitable arrangement of mirrors, prisms, and lenses, throwing the image of a hair line reflected from the galvanometer mirror upon a long translucent scale mounted in the piling rail, as may be seen in Fig. 1.

Other unusual features of the new set, which also were necessary because of the increased accuracy required, are the high insulation provided for all resistances and parts of the circuit, and the extensive "guard" system which prevents any leaks over the insulation from appreciably affecting the reading of the galvanometer.

The galvanometer is of the double-suspension D'Arsonval type and does not require accurate leveling. It rests on a weighted base which in turn

rests on sponge rubber—an arrangement that acts as a mechanical filter to eliminate all vibrations except those of very low frequency.

The arrangement of the optical system is shown in Fig. 3. A lamp assembly, consisting of an automobile type lamp, a hair-line sweated across a flat annulus, and a lens for condensing the rays from the lamp on the mirror of the galvanometer, is mounted just behind the key shelf. Rays from this unit are reflected by a prism in the lower part of the section, through a lens, onto the galvanometer mirror.

From this mirror the rays are reflected back through the same lens and prism to a mirror just behind the piling rail, which reflects them onto the scale. The zero position of the galvanometer and the position of the prism may be adjusted from the rear of the section by a lever and a screw projecting through the galvanometer housing. A pilot mirror affords a view of the scale in the piling rail while this adjustment is being made.

Small adjustments of the zero of the scale are made from the front of the section by an adjusting knob, which moves the scale to the left or right. The sensitivity of the galvanometer is such that with one volt impressed across the galvonometer in series with 200 megohms, a deflection of one millimeter is obtained.

Ideal conditions for the location of grounds require that all the current flowing into the test circuit and line pass through the two arms of the bridge, the two line conductors, and to ground through the fault. Leakage of current from the circuit at any point except the fault or the bridge apex tends to destroy the accuracy of the measurement obtained. Where the normal line insulation is not sufficiently high so that the effect of leakage through it can be neglected, it can, in general, be compensated by making two measurements, one from each end of the line. Leakages within the bridge cannot be compensated in this manner.

The accuracy of a fault-locating measurement is influenced by the leakage resistance of the bridge as a whole in a manner indicated by the curves of Fig. 4. It is seen from these curves that with a two megohm fault, an error of about 100 feet may occur when the effective insulation resistance to ground of the bridge (if located at the point shown in the figure) is 10,000 megohms.

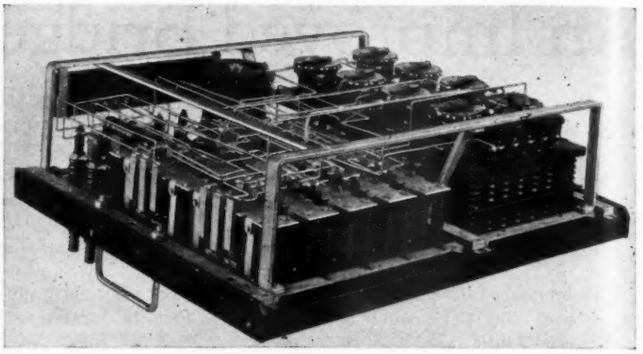


Fig. 5. View of Under Side of Bridge Showing High Insulation, and Guard Plates Used On All Component Parts of Unit.

To keep errors small, it is necessary, therefore, either to make the insulation resistance of all parts of the bridge very high or to provide other means of compensation. To secure high insulation resistance within the confines of a bridge small enough to fit into a toll test board was found to be impracticable. An equivalent sensitiveness may be obtained, however, by a suitable system of "guarding."

Such a guarding system is incorporated in the new bridge. It is secured by dividing the insulating supports of all parts of the bridge into two sections by a common metallic guard connected to the apex of the bridge. Such an arrangement reduces the flow of leakage current from the insulated parts back to the battery over the first half of the insulation, since the metal plate at the mid point of the insulation is at the same or a slightly higher potential than the part itself.

Leakage current that flows from the metal plates back to the battery over the second half of the insulation cannot affect the balance of the bridge because it is not current that has passed through the bridge resistances or the galvanometer. With this guarding arrangement the effective insulation resistance of the bridge can be greatly reduced without materially affecting the accuracy of measurements.

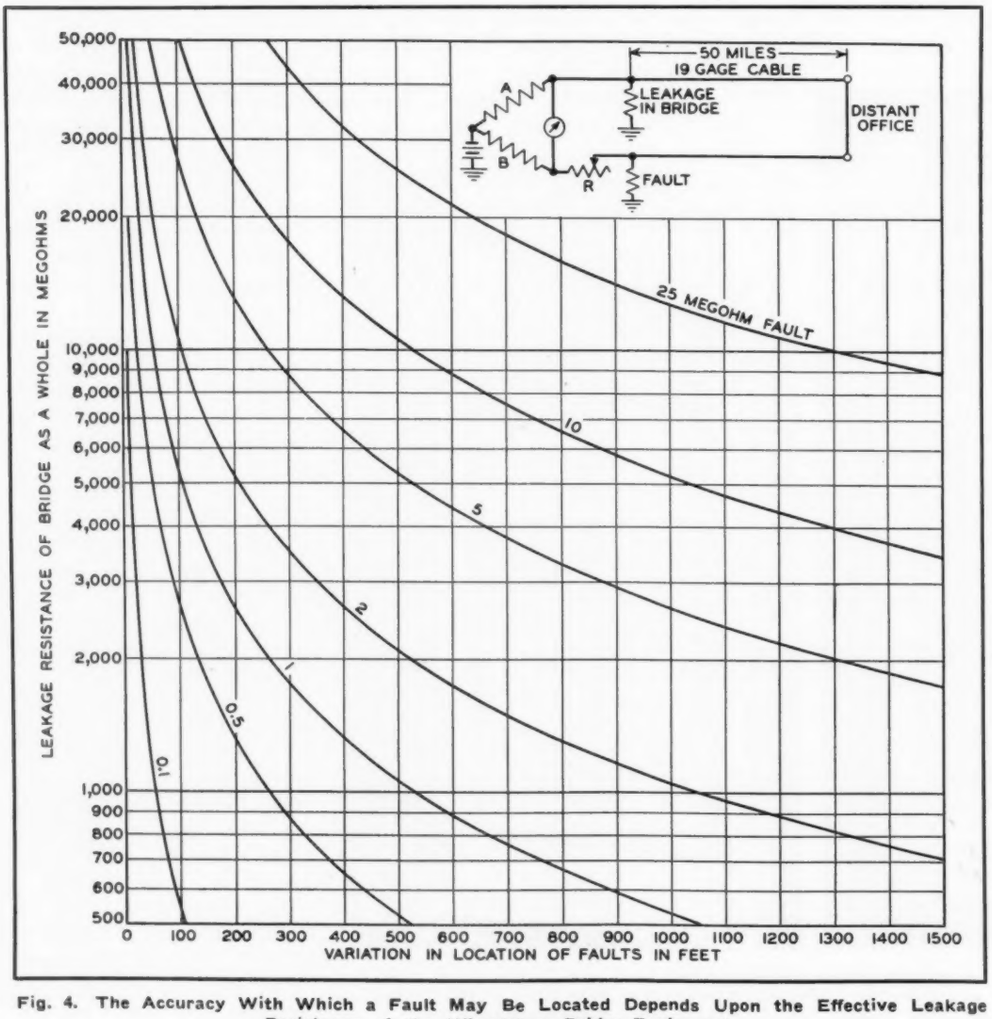


Fig. 4. The Accuracy With Which a Fault May Be Located Depends Upon the Effective Leakage Resistance of the Wheatstone Bridge Equipment.

The arrangement of the metal guard plates is shown in Fig. 5, and the general scheme of electrical connections in Fig. 6. If guard plates were not employed, leakage current would flow, for example, from points *a'* and *b'* to ground over the insulation.

If the two leakage currents were of the same value, and the ratio arms of the bridge were 1 to 1, these currents would balance each other and the galvanometer would be unaffected. If one were greater than the other, which is always the case in practice, the balance would be destroyed and the location found for the fault would not be correct.

When guard plates are employed, however, no leakage can flow to ground from *a'* or *b'* because the guard plates are at slightly higher potential than these points as already noted. There are leakage currents flowing from the guard plates toward *a'* and *b'*, which if unbalanced would tend to affect the galvanometer deflection; but because of the small voltage across the insulation between the guard plates and the points *a'* and *b'*, the unbalanced current is too small to be appreciable in fault location.

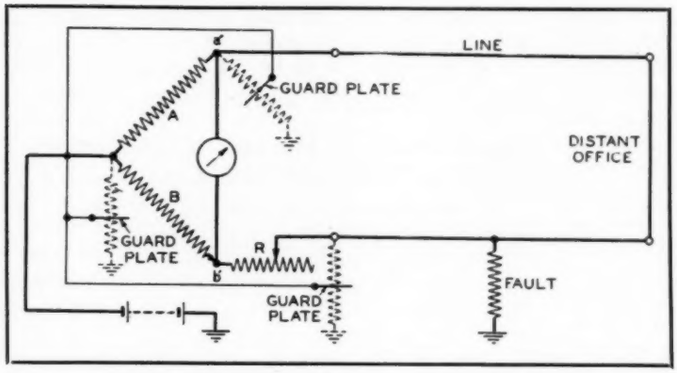
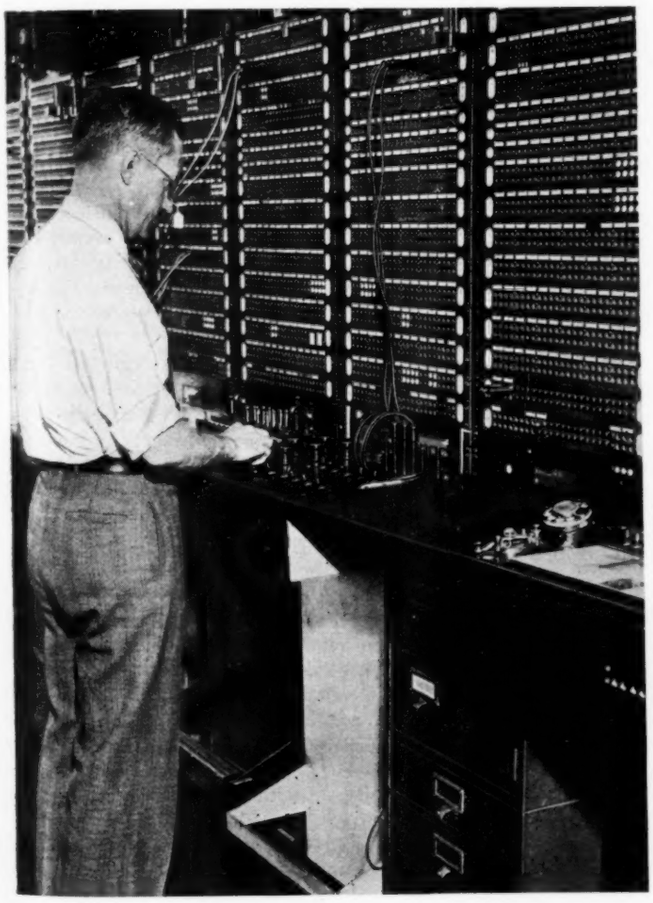


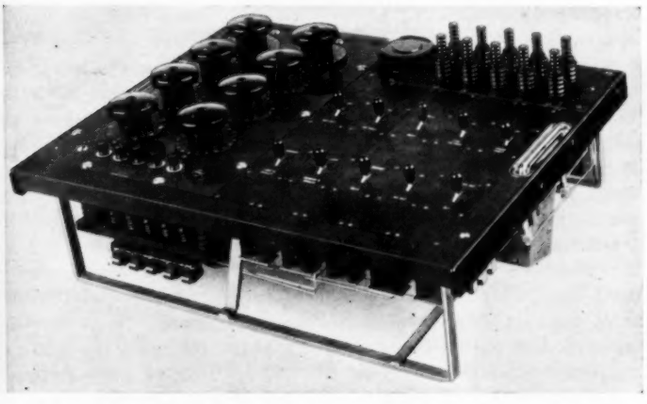
Fig. 6. Simplified Schematic Arrangement of the Wheatstone Bridge and the Guard Plates.

Dials for operating the various resistances, keys for performing the switching operations required, and jacks for connection to the lines under test are mounted in the top of the bridge unit which mounts in the keyshelf of the test board. Its arrangement is shown in Fig. 7.

The group of jacks at the back of the bridge unit on the right are those employed for connecting to the line under test. Highly-insulated trunks run directly from one group of these jacks to the protector frame, and another group of jacks serves as terminals of the bridge. Short patching cords are used to connect from one set of jacks to the other.

Any of several different battery voltages may be employed—depending on the type of fault—by operation of certain of the keys. Other keys are employed to set up rapidly the various connections required for the type of test being made. The same high insulation and guarding that has been described in connection with the bridge resistances is also applied to the keys, jacks, and all parts of the set.





The Accuracy With Which a Fault in Toll Lines May Be Located Depends Upon the Precision of the Bridge, On the Sensitivity of the Galvanometer, On the Insulation of the Testing Equipment, and on the Conditions of the Line. Fig. 7. Keyshelf Assembly of the Highly-Insulated Wheatstone Bridge Unit.

Communication Facilities Temporarily Swamped.

Simultaneously with the arrival of the telegraphic news flashes in New York City on Friday night, March 10, reporting the California earthquake, a woman who would not give her name, called the news department of the New York Times.

"You might be interested," she said, "in knowing that I have just tried to communicate with Los Angeles by telephone. When I had made connection with the Los Angeles operator the girl's voice, calm and unhurried, came over the wire:

"'Sorry; I cannot connect you. We're having an earthquake.'"

There was a rush all over the country to use the telephone and telegraph to ascertain the safety of relatives and friends in the earthquake zone in California and both means of communication were temporarily swamped with the traffic.

"Earthquake" messages were dispatched from New York City alone at an average rate of 10,000 an hour throughout Saturday, March 11, over Western Union wires, and the rate over the Postal Telegraph company's system was estimated to have been in similar proportion.

The New York Telephone Co. reported transmission of long distance calls from Africa, England and European countries as well as from New York and surrounding cities. A country-wide demand for communication with the earthquake area was taxing facilities and occasioning difficulty in making connections, New York representatives of the telephone system said on Saturday, March 11.

The New York Telephone Co. accepted calls in the forenoon of March 11 subject to a three-hour delay, because of the great pressure from other parts of the country for communication with the district around Long Beach and Los Angeles, and because of the difficulty of locating subscribers, many of whom had left badly damaged dwellings.

An afternoon statement issued by the same company on March 11, told of the routing of one African and several British and European calls through New York, and announced that from 4:30 p. m. until further notice calls were being accepted subject to a delay that might reach an hour. About 600 calls to the towns affected by the earthquake had been put through during the day, as compared to an average for other days of between 25 and 30.

An official of the company said on Sunday night that a total of 1,042 calls was completed between New York and Los Angeles between midnight Saturday and 6 p. m. Sunday. This included calls from foreign countries routed via New York.

On Saturday afternoon, March 11, the Illinois Bell Telephone Co. announced that lines had been opened to all points in the area except Long Beach and that long distance operators were almost caught up with the avalanche of calls that caused a four-hour delay Friday night and Saturday morning.

Press dispatches from Los Angeles, Calif., stated that the telephone utilities suffered most heavily from the temblors, thousands of telephones going out and service being conducted only under restrictions in the city limits with little or no general telephone communications to the harbor communities.

A news dispatch from Long Beach told of conditions there after the earthquake. It was stated that the telephone buildings in Long Beach and Compton were shattered and all persons in them were ordered out, cutting off telephone service from the outside world. The building of the Associated Telephone Utilities Co., Inc., in Long Beach was badly damaged, but a corps of long distance operators remained at their posts assisting police, firemen and naval authorities in maintaining a communicating system.

During one of the shocks the wall of the telephone company building on the third floor, where the long distance operators were on duty, cracked badly, opening a six-inch gash. The shock continued, completely closing the crevice.

An interesting illustration of modern speed in communication and transportation was presented in the Chicago morning papers on March 13.

William Evans, an eye-witness of the earthquake disaster in southern California, arrived in Chicago on March 12 on a United Air Lines plane. Mr. Evans eagerly called for newspapers immediately after alighting from the plane and looked at the reproductions of photographs which had traveled ahead of him to Chicago, by telephone wires.

Capitalization of Japanese International Telephone Company.

The November 24, 1932, issue of The Japan Advertiser, Tokyo, says wireless telephone service between Japan and other parts of the world will become a possibility sometime during 1934, according to the plans of the International Radio-Telephone Co., Ltd., recently promoted. An earlier report stated that the Japanese Ministry of Communications had granted a franchise to the International company to develop a system of radio-telephony from Japan.

The company will be a semi-government organization under the direction of the Ministry of Communications. Arrangements have already been completed with several countries fixing charges for conversations. The new concern is to have a capital of yen 10,000,000 (about $5,000,000 at normal exchange), made up of 200,000 shares with a face value of 50 yen each. A total of 50,000 shares were recently put on the market and oversubscribed 40 times.

Subscribers Object to Party Lines with Sororities or Fraternities.

Fraternities and sororities of Akron University, Akron, Ohio, may no longer be served by party-line telephones. Telephone subscribers with fraternities or sororities on their lines have asked the Ohio Bell Telephone Co. for relief.

According to N. R. Mitchell, Ohio Bell district commercial manager, a check on one of the sororities revealed that the line was in constant use from 4:30 one afternoon until 11 o'clock that night.

What Operators Want to Know

Instruction for Handling Calls Where There Is a Delay in Reaching the Toll Center—Giving Report of Delay to the Calling Party—Time Allowance for Holding Toll Circuits—No. 90

By Mrs. Mayme Workman,
Traffic Supervisor, Illinois Telephone Association, Springfield, Ill.

In question No. 3, the operator is asking what should be said to the subscriber when she is unable to reach the toll center for five minutes.

If the toll center does not answer, when you ring, after you have rung for 30 seconds, at 10-second intervals, and no other circuit or trunk is available to the toll center, consider that an NC (or "all trunks busy") condition exists and give the proper report to the calling party.

It might be well at this time to review our instructions in regard to holding toll circuits and ringdown trunks. After you have taken up a toll circuit or ringdown trunk and rung, the time allowance for holding the toll circuit or ringdown trunk waiting for an answer from the distant office is 30 seconds, during which you repeat the ring at 10-second intervals. At the end of 30 seconds, if you have received no answer from the operator at the distant office, proceed as follows:

(1) If another circuit of the proper class on the same route or another ringdown trunk is available, use the second circuit or trunk. As an overlapping operation, follow the usual procedure for reporting the circuit or trunk in trouble and refer the case to your supervisor.

(2) If another circuit, not of the proper class is available on the same route, use it to reach the distant office and say: "Answer on (number of circuit)," or, for example, "Have Rx answer on (number of circuit)," if a transfer is necessary. If you are able to establish a connection over the first circuit but the transmission is unsatisfactory, follow the usual procedure for reporting unsatisfactory transmission.

If you are not able to establish a connection over the first circuit, or even if you establish a connection that seems satisfactory, follow the usual procedure for reporting the circuit in trouble and refer the case to your supervisor.

After an order for a circuit has been passed to an intermediate office or an order for a ringdown trunk has been passed to the TTC, the time allowance for holding the toll circuit awaiting an answer is 30 seconds. At the end of 30 seconds, if no answer has been received on the toll circuit or ringdown trunk, AG the order, saying: "AG (order as originally passed)."

The instruction for holding and releasing toll circuits and ringdown trunks will be concluded in next week's introduction to the questions and answers.

Questions from Illinois Operators.

1. Why should the tributary operator handle her toll calls by the CLR method?
2. What can an operator do when she passes a toll ticket to her toll center and has to wait 10 or 15 minutes before the toll center takes the ticket?
3. What should be said to the subscriber when the toll center cannot be reached for five minutes?
4. On a "ticket transfer" is the second report charge collected?
5. How does the toll operator return coins on a prepay?

For answers to these questions from real Illinois operators, please turn to page 28.

Outside Plant Men Talk Things Over

Carelessness Is One Disease That Usually Kills Its Victim.

By JAKE THE LINEMAN.

Mornin', buddies! I see that in spite of all the happenings of the past two weeks, all of you are in a cheerful mood and,

J. H. Seaton, Dallas, Texas, Safety Supervisor of the Southwestern Bell Telephone Co., Who Has Been With the Company Since 1910, Worked Himself Up Through Various Positions in the Plant Department. His Knowledge of Safety Has Again Placed Him Among the Five Winners of a Recent "Telephony" Test.

buddies, that's great. Men and women of the richest lives are full of hope, pluck, courage and cheerfulness. They are strong when others are weak; hopeful when others are discouraged.

Buddies, if we're gonna come out on top of our present troubles we're gonna have to keep cheerful and face things bravely. A kind smile and a light heart drive away doubt, fear and distrust, so let's look on the bright side of things and be hopeful. It's going to take time but 'fore long we'll be installin' telephones instead of takin' them out, and then we'll begin to realize what a grand old world this really is.

The figures on automobile accidents for 1932 have just been released and it 'pears as though folks were a bit more careful with their cars durin' 1932. There were 745,300 motor vehicle accidents last year. Even though that figure is 114,700 accidents less than the total for 1931, it's too all-fired big.

A grand total of 904,800 persons was sent to the hospital for repairs and some of the poor victims will be helpless cripples for the rest of their days. Out of 29,000 persons killed, the largest number were pedestrians.

A study of the gruesome and disgraceful figures reveals the fact that 47 per cent of all the pedestrians killed were crossing streets either against signals, diagonally, or from behind parked cars. In view of the facts we're safe in sayin' that too consarned many pedestrians are ignoring the dangers of the street and are taking unnecessary chances which are causing tragic, needless deaths and unnecessary funerals.

Approximately 7,200 persons were killed because they had a desire for speed, which only brought them flowers and slow music. About 2,430 selfish persons decided that they had the right of way at all times, and their erroneous decision cost them their lives.

I could go on repeating figures for quite a spell but what's the use, when each group of figures proves the same thing: that there are too many careless drivers drivin' motor vehicles over the highways of this country. Something should be done at once about this wholesale slaughter of humans. As soon as the country gets the financial difficulties straightened out, I hope the law-making bodies will do something to make the streets and highways safer.

Now what say we have a few signals?

Sometimes a telephone worker has occasion to work in an elevator shaft. When such a job comes up always make sure that the operator knows of your presence, and will move the elevator only at your signal.

Always place tools and material, when you're working on a scaffold, so that there is no possibility of their falling.

Fire or police machines have the right of way over all vehicles. When a police or fire machine approaches you, if you can reach the right-hand curb, drive there and stop. If you cannot reach it, stop where you are until the machine passes.

Every once in a while I hear of an accident in which a central office man trips over scrap wire left lying on the floor between frames in central offices. Keep the floor clean between frames and pick up all scrap wires immediately. Dead jumpers should be coiled up and put away in a suitable container.

This is an excellent example of a needless accident: Employe was placing house cable in a building under construction. The head of a hammer, being used by a fellow worker, flew off and struck him on the head. Investigation disclosed that the hammer had been in defective condition for at least a month prior to the accident.

You are a hazard to your fellow workers if you go around with sharp-pointed tools and screwdrivers sticking out of your hip pockets. Not so many days ago a central office repairman, carrying a long screwdriver in his hip pocket, squatted down to do some work near the floor. A repair clerk passed near him and received a bad cut on the leg from the sharp edge of the screwdriver.

Proper supervision of employes will prevent many accidents. Supervisors should make every possible effort to develop a spirit of care and caution among their workers.

Always open or lock doors when working against or near them.

Your safety record depends entirely upon you. If you're careless your accidents will be numerous. If you observe the rules of safety, not an accident will mar your record.

Safety suggestions from employes are important. Employes, through close association with their work, are often able to submit helpful ideas for the improvement of operating conditions. Encourage your employes to submit their ideas.

Well, I guess that's 'bout enuf signals fer a spell an' I hope they will prove valuable to you.

From time to time I receive interestin' letters from buddies giving me details con-

H. D. Kauffman, of Monticello, Ind., a Winner in Safety Test, First Entered Telephone Field as Lineman at Wabash, Ind. He Was Employed by the Northern Indiana Public Service Co. for a Time. Later by the Southern Michigan Telephone Co. as Line Foreman. For the Last Six Years He Has Been Lineman and Wire Chief at Monticello for the United Companies.

cernin' accidents which have occurred in their vicinity. I've used these accidents to bring out our safety rules an' they've helped our buddies all over this country to do their work more safely than before.

The next time you read, hear about or see an accident that is a good example

of carelessness, drop me a line or send me the clipping concerning it, and we'll use it at one of our safety classes. If all of our buddies are on the lookout for accidents that have a lesson in them for telephone workers it won't take us long to cover every possible kind of accident which could happen to a telephone worker. An accident once discussed and the errors pointed out usually mean that a similar accident won't happen again.

Guess I'll be ramblin', but I'll be back 'fore long. Until then remember: "Safe ways are happy ways."

Automatic Charging for Small Common Battery Plants.

During these times of consolidating maintenance positions to effect economies in the operation of telephone plants, several plants are maintained by a wire chief from a neighboring town. One of the problems arising from such an arrangement is that of properly caring for the power plants of such offices. The application of automatic charging equipment to small common battery power plants provides many other advantages, however, which further extend its application to all small common battery power plants.

Bulb type chargers are now quite universally used to provide charging current in small common battery offices. They are particularly adaptable to automatic control.

We have recently installed automatic charging systems in five of our common battery offices and find their operation entirely satisfactory. The manifold advantages are as follows:

1. The attention of a maintenance man to adjust charging rate is not required. This eliminates frequent interruptions of service due to "flat" batteries.

2. The basis for the control of the charging equipment described herein is a voltage relay; i. e., the charger is automatically started when the voltage drops to a certain value and is automatically stopped when the voltage rises to a certain value.

Until recent years it was common practice to 'cycle" storage batteries; i. e., charge at a relatively high rate, then discharge with frequent equalizing charges. Storage battery companies now advise that ideal operation of storage batteries is had when the load is continuously floated. To do this, the voltage per cell should at all times be maintained between 2.1 and 2.2 volts per cell or an average of 2.15 volts per cell. If the voltage per cell is kept between these limits, the battery will take only such charging current as is necessary to keep it fully charged and in good condition.

Since ideal operation of storage batteries just consists in maintaining voltage between the voltage limits as just given, it immediately follows that automatic charging systems should be controlled by the voltage of the battery.

The ideal charging unit would be one whose voltage-load characteristic is such that the voltage at all times would continually be between the limits of 2.1 and 2.2 volts per cell. Such a charging unit for small plants, however, is probably uneconomical at this time.

3. Maximum life of storage batteries will be effected by maintaining the voltage at all times within foregoing limits. A minimum amount of water will be required by the cells.

4. While central office equipment is designed to operate with a much greater voltage variation than that maintained by the automatic charging system herein described, certainly more consistent operation of the equipment is effected by maintaining the

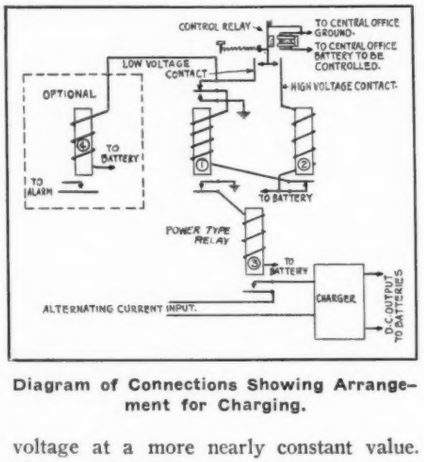


Diagram of Connections Showing Arrangement for Charging.

voltage at a more nearly constant value. This is particularly true of harmonic ringing converters.

5. A small saving will be effected, due to the fact that the battery is never overcharged; hence current consumption of the charge is minimized.

6. In case of a power failure, the battery will be fully charged, thereby providing a maximum reserve capacity.

A description of the installation follows:

With the voltage dropping to the "low" limit, the low voltage contact of the voltage relay closes, thereby operating relay 1. This relay locks and remains locked until the voltage rises to the "high" limit, thereby closing the high voltage contact of the voltage relay which operates relay 2, unlocking relay 1. The power type relay, 3, is, therefore, operated, while relay 1 is operated. In this manner, the charger is in operation from the time the low voltage contact closes until the high voltage contact closes.

An optional alarm feature is shown which operates so long as the low voltage contact remains closed.

This system might be used to control the rate of charge rather than entirely stopping charger when the high voltage limit has been reached. This would probably be done by continually charging the battery, but using the power type relay to change the charging current from a low value to a high value. The low value would be the charging current required during "light load" hours, and the high value would be slightly above the "busy-hour" load.

It would seem that the several advantages of this system, together with the low cost of such an installation, would make automatic charging indispensable in small and medium-sized common battery plants.

C. E. Bohnenblust,
Cameron, Mo. Chief Engineer,
Middle States Utilities Co.

"I Wonder Why" of an Observing, Traveling, Telephone Engineer.

By Ray Blain.

I wonder why some telephone companies will permit an idle position of a switchboard to be stripped of its equipment to make repairs on busy positions?

The average multiple switchboard has one or more positions which are never used by operators under ordinary circumstances, and it is a common practice in some exchanges to rob them of any parts needed to make repairs on working positions.

Another common practice, although never a pleasing sight, is to see about half of the cords missing from idle positions. No money is ever saved by this practice. Should an emergency ever occur which made it necessary to use all positions, in addition to the fact that they are unserviceable, there would probably not be enough repair parts on hand to place them in operation, even after hours of delay.

It is believed that a good practice is to routine test all idle positions in the same manner as the working ones, to insure that they are in a serviceable condition at all times. Cords should also be kept in repair and plugs polished. When cleaning the switchboard, both inside and out, the idle positions should never be slighted.

By maintaining the idle positions in this manner, not only will they be ready for instant use, but it will also improve the appearance of the switchboard as a whole.

It is a good practice never to remove apparatus from one position to make repairs on others except in great emergencies.

Repairman Finds Source of Mysterious Fires in Farm House.

Bert Howell, repairman of the Southern New England Telephone Co. in New London, Conn., while out on a case of loop trouble recently, stopped at a house in the country where a woman told him that mysterious things were happening in the house.

She showed him a rug that had just burned in some unaccountable manner. The repairman smelled smoke and found that at that very moment the shingles on the porch were burning. He was puzzled at first but after a time discovered that a bottle, half filled with water, was acting as a sun glass and setting fire to objects within its focus.

Here and There in Telephone Work

Advertisements of Athens, Ohio, Company, Attract Attention.

Another of the series of advertisements, published by the Athens Home Telephone Co., Athens, Ohio, of which Dr. C. L. Jones is general manager, appeared in a recent issue of the Sunday Messenger. Taking up a full page, the company presented photographs showing its five exchanges at Albany, Chauncey, The Plains, Amesville and Athens, and had them labeled "Taxes versus Income."

Discussing the matter of exchange properties and taxes, the advertisement read: "These buildings are quite necessary in the rendering of telephone service in the central part of Athens County and are submitted as a partial justification for our tax assessment of over $15,000 during the current year."

The company also directed attention to the fact that it was taxed $1,100 for unemployment, saying:

"The telephone company is required to pay more than $1,100 into the special tax fund for the relief of unemployed. The telephone company, more than nearly any other enterprise in or around Athens, has tried to do its bit in relieving the unemployment situation for more than two years past."

These advertisements by the Athens Home Telephone Co. discussing various phases of the company's operations, have attracted much attention from telephone men and are believed to be doing a great amount of good in informing the public of the company's status. The message contained in them is brief and to the point, and discusses only one subject at a time.

Flying Squadron Notes Changing Style; Reconnecting Telephones.

There has been noticed lately a curious sidelight in connection with telephone loss, states a writer in the Telephone Bulletin, employes' magazine of the Southern New England Telephone Co. For a while it became almost fashionable to deprive oneself of one's telephone, just as it was stylish last year to "talk poor."

After one or two subscribers in a neighborhood or apartment house had been forced by real need of economy to give up their telephones, others followed suit—just keeping up with the Jonses—even though they had no real need to. The rest of the story is that there are indications the style is changing and the telephones are being put back again.

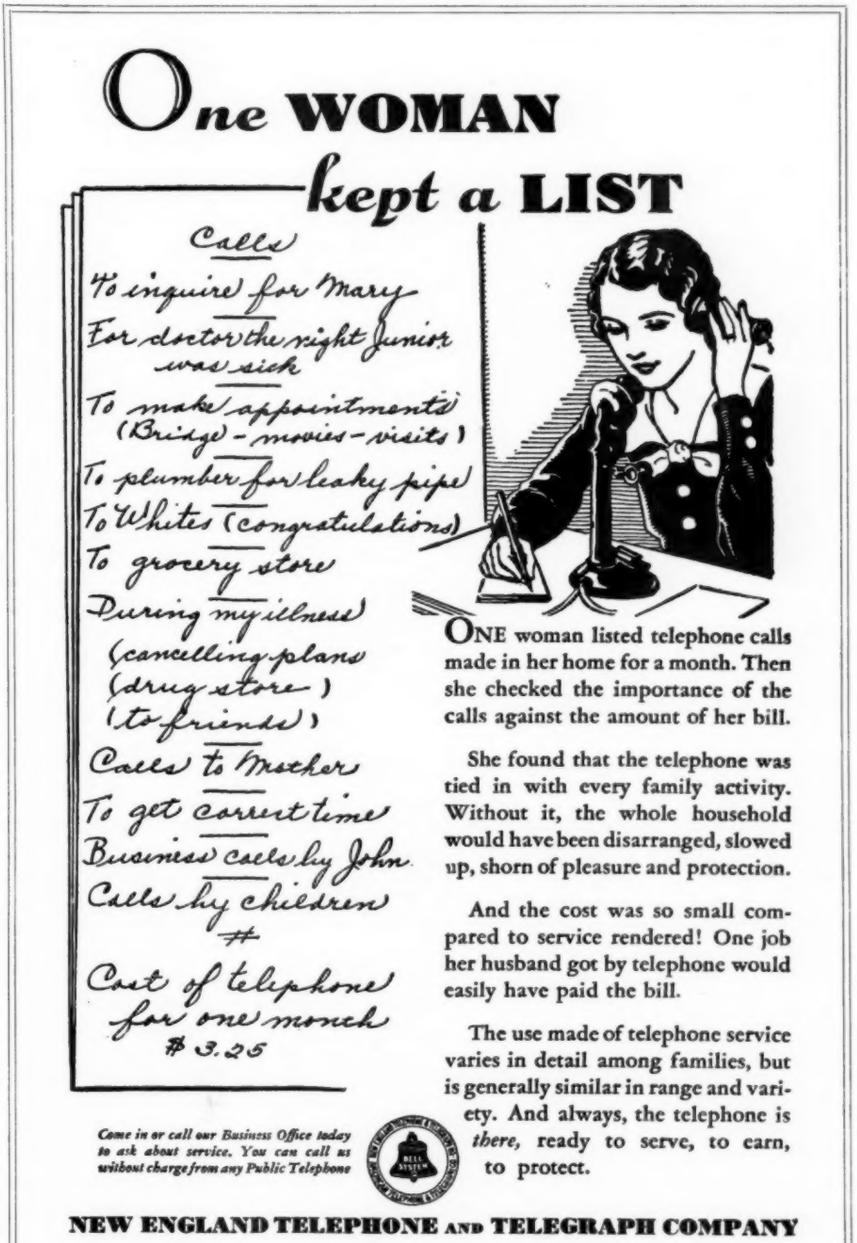
In the interval, the customer has lost the incalculable value of his service; has found that it actually cost him more in many ways to be without a telephone than to pay a few cents a day and have one; and frequently it has been brought home to him that "one telephone call may be worth the cost of the service for a lifetime." Doing without a telephone was only a false economy, and instead of being a net gain, proved to be a net loss.

Recently a member of the flying squadron succeeded in convincing a New Britain, Conn., housewife that she should have her telephone reconnected after she had been without it for five months. On the following day in another section of the city, the salesman ran across a woman by the same name—an unusual one.

Inquiry brought out the fact that she was a sister-in-law of the new subscriber, and a sale to her followed, due principally to the fact that she could call up the other family and visit.

Advertisement Strikingly Pictures Value of Telephone Service.

The New England Telephone & Telegraph Co. recently published a clever and


One WOMAN
kept a LIST
Calls
To inquire for Mary
For doctor the night Junior was sick
To make appointments (Bridge - movies - visits)
To plumber for leaky pipe
To Whites (congratulations)
To grocery store
During my illness (cancelling plans (drug store) (to friends)
Calls to Mother
To get correct time
Business calls by John
Calls by children
#
Cost of telephone for one month
$3.25
ONE woman listed telephone calls made in her home for a month. Then she checked the importance of the calls against the amount of her bill.
She found that the telephone was tied in with every family activity. Without it, the whole household would have been disarranged, slowed up, shorn of pleasure and protection.
And the cost was so small compared to service rendered! One job her husband got by telephone would easily have paid the bill.
The use made of telephone service varies in detail among families, but is generally similar in range and variety. And always, the telephone is there, ready to serve, to earn, to protect.
Come in or call our Business Office today to ask about service. You can call us without charge from any Public Telephone
BELL SYSTEM
NEW ENGLAND TELEPHONE AND TELEGRAPH COMPANY

Advertisement Which Effectively Pictures in the Reader's Mind the Value of Telephone Service.

effective advertisement in Boston newspapers. It strikingly brought out the value of the telephone to women in their everyday life in the home. The advertisement was based upon the idea of recording each telephone call made and its purpose, in order to indicate the importance of the calls to the members of the household.

The advertisement which is reproduced on the preceding page, suggests the writing down on a memo pad of the calls and reviewing them at the end of the month when the telephone bill is received. This gives a striking illustration of the value of a telephone and is effectively brought out in the advertisement.

Curious Names in Telephone Directory Furnish Pastime.

A newspaper writer for The Baltimore Sun has indulged in a pastime which might commend itself to others, especially city dwellers, as an interesting way to "kill time" on a rainy day. He has thumbed his way through the telephone directory in Baltimore, Md., and has found, among other things, that names of telephone subscribers include many occupations of people in every walk of life.

A glance through a recent edition of the Baltimore telephone directory, which is put out by the Chesapeake & Potomac Telephone Co., revealed such classifications as Baker, Bishop, Constable, Diver, Driver, Duke, Earl, Farmer, Judge, Justice, King, Lord, Major, Manager, Mason, Mechanic, Merchant, Miller, Miner, Page, Pope, Prince, Queen, Rector, Rider, Singer, Sexton, Taylor and Trader. At the present time some of these people are working at a Loss and some at a Proffitt.

The names of nationalities found among the listings are German, Irish, Roman, Swiss, Turk and Welsh. A Gentile and a Pilgrim are also listed, as are France, Holland, Rome and Wales.

The colors enumerated are Black, Blue, Brown, Gray, Green, Golden, Rose and White. People may be classified as: Best, Better, Bitter, Bright, Close, Dull, Fair, Faithful, Fine, Free, Fresh, Gay, Good, Little, Meek, New, Sinners, Small, Smart, Sober, Stout, Strong, Swift, Tall, Valiant, and Wise.

The outdoors is represented by Bay, Beach, Bloom, Cove, Falls, Field, Flowers, Lake, Lane, Leaf, Marsh, Moon, Moss, Orchard, Parks, Plant, Pool, Rock, Shade, Shore, Sand, Stump, Trail, Thorn and Weed. Ash, Birch, Cherry and Chestnut grow there, and it needs no naturalist to find a Bass, Bird, Crow, Bugg, Fox, Hare, Sparrow, Stork, Trout or Wolf.

The weather is suggested by Blizzard, Gale, Clear, Frost, Snow, Storm and Waters. The four points of the compass—North, South, East and West—are found, as are Day, Weeks, Noon, Holliday, March, May, Spring and Winter. Cotton, Glass, Wheat, Cable, Nickel, Silver, Gold, Silk, Stone, Tarr, Wood and Zink are also found.

Issuance of the telephone directories of the associated companies of the Bell System comes close to breaking all printing records for volume, speed of production and accuracy, it is claimed. There are distributed among subscribers of the Bell System more than 1,900 different directories, with a total issue of about 36,000,000 copies.

SELLING THE SERVICE.

By John G. Reynolds.

1. How many "No Telephone" reports do you have at your exchange each day? Why not start today to keep a record of calls placed to persons who are without telephone service? Show the non-subscribers that they are missing valuable calls, and watch the results.

2. Encourage your employes to exercise their powers of observation and thus be on the constant lookout for non-subscribers and subscribers who have inadequate service. In many of the friendly and business contacts which we make daily there lies a chance for a sale.

3. No salesman should allow one "No" to discourage him. Allow nothing to discourage you. If you make a wholehearted attempt to get new business and fail, don't whine or pout about it. Just greet the next prospect with greater determination to sell him service—and you'll probably succeed.

4. Managers, who sell a subscriber and then proceed to forget about him, are overlooking a wonderful chance for selling additional service. Keep in close contact with subscribers, and make sure that their equipment and their attitude toward your company is in A-1 condition.

Have you an interesting sales plan which is boosting up your revenue? If so, why not drop me a line describing it, so I can pass it on?

Highest Eastern Peak Gets Telephone Service.

The observatory at the top of Mount Washington, in the White Mountains, now has telephone communication with the outside world.

The former private mountain line has been connected with the Bell System through the central office at Whitefield, N. H. The service will be of value not only to tourists and mountain climbers, but also to the three weather observers stationed at the top of the highest peak east of the Mississippi River.

British Telephones Show Gain of 66,300 in 1932.

The British Postmaster General, Sir Kingsley Wood, addressing the Coventry Chamber of Commerce on January 17, said it was estimated that for the world as a whole, 2,000,000 telephrones had been put out of service in 1932, with the decrease chiefly in the United States.

In the British Isles, however, he reported the number had increased by 66,300, making the present total in use 2,133,000.

Personal Notes from the Field

A. L. Stadermann, of Terre Haute, Ind., for several years secretary and treasurer of the Citizens' Independent Telephone Co., has been named acting general manager of the company to succeed the late Hart F. Farwell, who was president and general manager.

Mr. Stadermann was born on February 20, 1878, in Cincinnati, Ohio. In 1893, at the early age of 15, he secured employment in the manufacturing end of the Independent Industry. A year and a half later he entered St. Xavier College where he studied along classical lines until 1896.

Later, he took an engineering course at the University of Cincinnati, graduating in 1900 with the degree of B. S. After a post-graduate course at the University of Cincinnati, he entered the employ of the American Telephone & Telegraph Co. as equipment inspector, with headquarters at St. Louis, Mo., his duties being to install and inspect equipment.

Mr. Stadermann became associated with the Cincinnati & Suburban Bell Telephone Co. in the equipment department in March, 1902. In 1905 he went to the Kinlock Long Distance Telephone Co. at St. Louis.

On April 1, 1906, he was appointed chief engineer of the Citizens Independent Telephone Co., the Kinlock-Bloomington Telephone Co., and the Wabash Valley Telephone Co., with headquarters at Terre Haute, Ind. In 1913, Mr. Stadermann was made secretary and treasurer of these companies, in addition to his position as chief engineer.

In December, 1923, he was appointed by the United States Independent Telephone Association as its representative on a committee of three members to constitute the telephone group of the American Engineering Standards Committee. The purpose of the committee was to represent the Bell and Independent telephone industries in any standardization work affecting the telephone industry.

Mr. Stadermann is a member of the

American Institute of Electrical Engineers and the Independent Pioneer Telephone Association of the United States. He has been very active in all the annual conventions of the United States Independent Telephone Association, as well as the various group meetings held in different sections of the country.

Harry Ehrsam, of Enterprise, Kans., manager of the local exchange of the United Telephone Co. for many years, retired on a pension on January 1. He has managed the telephone exchange in that community practically since it was built.

When C. L. Brown started the Brown Telephone Co. in Abilene in 1899, there were few towns with telephones in central Kansas. Soon after 1900, exchanges were built in Enterprise, Chapman and Hope to make a county-wide system.

D. A. Van Trine, manager at Salina, built the Enterprise exchange. The switchboard was placed in a jewelry store. After trying several men as manager, Mr. Ehrsam was offered the chance to operate the exchange. He knew little about telephones when he accepted the assignment. He was already familiar with public utilities, as he was in charge of the local water works and the city electrical system.

Mrs. Ehrsam joined him in the operation of the exchange, and they have been in cnarge for more than 30 years. Of the original 30 subscribers at Enterprise, seven retain the same numbers today.

A farewell dinner was given for Mr. Ehrsam in Hotel Sunflower in Abilene. C. L. Brown, Fred Coulson and others, who have been associated with him for many years, gave talks. He was presented with a leather pocket set as a farewell gift from the company.

Mrs. Ehrsam, who is also a pioneer in telephony, has been appointed agent at Enterprise.

Obituary.

Louis N. Stoskopf, of Great Neck, Long Island, N. Y., general manager of the long lines department of the American Telephone & Telegraph Co. died on Saturday, February 18, at his home after a long illness.

Mr. Stoskopf was born in Toronto, Canada, 48 years ago. He worked for several years for railroad and telephone companies and in 1905 became a "repeater man" for the American Telephone & Telegraph Co. at Chicago, Ill. In 1913, he became supervisor of the special contract service in the Chicago district and in 1914 he became district plant chief at Cleveland, Ohio.

In 1920 Mr. Stoskopf was promoted to general supervisor of the long lines department at the New York City headquarters and in 1924 was made general plant manager for the department.

He became general manager of the long lines department for the whole system in 1930.

Mr. Stoskopf was a member of the Masonic order as well as a member of the Telephone Pioneers of America.

He is survived by his widow, Mrs. Ida M. Stoskopf; his father, Louis Stoskopf of Toronto; three sisters, Mrs. Clare Hinan of Montreal, Mrs. Earl Downs and Mrs. Edward Hurley, both of Toronto, and three brothers, Robert of Detroit, Albert of Toronto and Andrew of St. Catharines in Canada.

Mrs. Walter O. Pennell, wife of the chief engineer of the Southwestern Bell Telephone Co., died suddenly at her home, 330 Oakwood Avenue, Webster Groves, Mo., on February 12. Burial was at Exeter, N. H.

Mrs. Pennell, who was 58 years old, before her marriage was Sarah M. Corson of Philadelphia, Pa., where she had been born of an old colonial family of French Huguenot descent.

Mrs. Gertrude M. Uprichard, wife of John Uprichard, vice-president and general auditor for the Ohio Bell Telephone Co., Cleveland, Ohio, died on February 21. Funeral services were held on February 24.

Fred J. Boynton, formerly chief traveling auditor of the New England Telephone & Telegraph Co., died of a heart attack at his home in Boston on March 12. He was 78 years of age and retired from business in 1925.

Mr. Boynton entered the telephone industry in 1881, going to Boston two years later to open the books of the New England company. He became auditor in 1884 and chief traveling auditor in 1911. For many years he had been secretary-treasurer of the Thomas Sherwin chapter, Telephone Pioneers of America.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Engineering and Supervision Argued in Wisconsin Bell Case.

On March 7, 8 and 9 the Wisconsin Public Service Commission heard testimony at Milwaukee in its state-wide investigation of rates and practices of the Wisconsin Telephone Co. Following the session on March 9, the hearing was continued to March 20.

John H. Bickley, chief accountant for the commission, was on the witness stand on all three days and testified to engineering costs and the company's accounting methods. The engineering and supervision costs of the Wisconsin Telephone Co., amounting to more than $1,000,000 a year, are excessive and have been increasing, and its methods of recording these overhead costs are unreliable, he declared on March 7.

The unreliability of the records was such, he testified, that in 1932, when the company's estimates went far wrong, 44.31 per cent was added to contractors' bills to unload engineering expenses. Linoleum for the Hilltop exchange, for example, cost $1,938.68, and "engineering" on the linoleum cost $859.04.

He cited many other examples, among them being mirrors for the Milwaukee Hilltop exchange for $53.46, to which was added $23.69 for costs of engineering and supervision of the purchase; lawn fertilizer for the Hilltop exchange costing $31.25 plus $13.85 for engineering and supervision; a wardrobe lock for the same exchange costing $2.75 plus a $1.22 engineer and supervision charge. A painting job cost $1,000 and $443.11 were added for engineering and supervision.

Mr. Bickley said that his staff had made every effort to ascertain the specific engineering cost on a given job but that the company had no such records, or at least professed not to have them.

The witness produced a voluminous company report on the Milwaukee Hilltop dial conversion, prepared before the work was undertaken. He said that it was evidence of the amount of work done and indicated that the cost of such preliminary work was considerable.

Engineering and supervision consists of the preparation of fundamental plans for future and immediate construction, the formulation of practices for plant construction and maintenance, preparation of designs, plans, specifications and estimates, studies of such matters as depreciation, and similar work.

In 1921 engineering and supervision costs totaled $305,237, Mr. Bickley stated. By 1930 they had mounted to $1,214,863, an increase of 398 per cent. In 1932 the total was $1,074,303. Total expenditures for construction and maintenance increased 298 per cent from 1921 to 1930.

Mr. Bickley said that the company's methods of charging off the expense of

such work were based on estimates made at the beginning of the year, and not on facts, with the result that the overhead rates were hypothetical and not actual and that the company's method made it possible to obtain any desired result. The charges are made against work to which the engineering and supervision expense has little if any application.

Under the methods used by the company, he said, it is guaranteed all engineering expenditures, whether or not the engineering work is productive of income or of property.

The hearing on Wednesday, March 8, was devoted largely to detailed testimony by Mr. Bickley, seeking to prove statements he made on the previous day that engineering and supervision costs (overheads) of the company were excessive.

At the outset, Frederick Sammond, counsel for the company, denounced as "cheaply sensational" the testimony which Mr. Bickley gave, that the company's method of unloading its engineering expenses was so unreliable that it resulted in a $859 charge for "engineering" on a purchase of $1,938 worth of linoleum, a $1.22 charge for "engineering" on a $2.75 wardrobe lock, a $109.35 "engineering" charge on a shipment of brick which cost $246.78, and many similar items.

Mr. Sammond's motion to strike out this testimony was overruled.

The company's attorney informed the commission that the engineers found it impossible to separate their time on a particular project as to what they put in and what was taken out of the project.

"Consequently," he said, "engineering is divided, not as to how the engineers devote their time but according to the total amount of labor involved in a project." He added that removals were charged against depreciation, anyway, and not against operating expense.

Testimony on March 8 revealed that in addition to $16,633,763 paid by the Wisconsin company in the last 12 years to the Western Electric Co. on contracts for installation of equipment, the Wisconsin company added $1,175,482 for engineering on the projects, which went into its capital investment.

Mr. Bickley testified also that in the last 12 years, 20 per cent of the company's general expenses, including officers' salaries and legal expenses, had been added to the investment on which telephone users must pay a fair return. The total so capitalized was $665,444, he said.

"The percentage of plant payrolls to construction of the Wisconsin Telephone Co. in 1931 was 29.1 per cent," he stated. "During the years 1928, 1930 and 1931 the Wisconsin Telephone Co. payroll was the highest in the Bell System. Figures for the year 1929 were not available."

Wisconsin's overhead rates on company construction also were the highest in the Bell System during 1931, Mr. Bickley said, citing a construction rate of 11.5 per cent. In 1928 it also had the highest loading, he stated.

The per cent of plant engineering expense to construction work performed by the company has been "comparatively high except for the year 1924," he said.

In 1931, he testified, Wisconsin had the highest rate in the Bell System; in 1930 it had the third highest rate; in 1928 the highest rate; in 1926 the fourth highest; in 1925 the third highest; in 1924 the eighth highest.

The per cent of plant supervision expense to construction work performed by the company "in general has been comparatively high, although not as high as has been general engineering and plant enginering," the witness stated.

On March 9 the hearing was continued to March 20, after arguments over engineering costs and the company's accounting methods.

Mr. Bickley declared the company's accounting was "guess work" and charged that excessive engineering costs were listed for such work as shaving poles.

Arguments in the hearing centered around the question of whether the company reimbursed itself from current revenues for expense of engineering and construction which actually were deferred or abandoned.

Engineering Problems Covered

New England Telephone & Telegraph Co., in Presenting Defense in Pending Rate Case in Boston, Discussed Engineering and Operating Problems—Statistics on Operation of Dial System Given

As the New England Telephone & Telegraph Co.'s rate case proceeds before the Massachusetts Department of Public Utilities in Boston, many penetrating analyses of engineering and operating problems, bearing upon economic aspects of communication are being discussed. The testimony of George K. Manson, the company's chief engineer, reveals many points of interest.

The company opened testimony in its case on February 27, and four days were devoted to this presentation. Hearings have been adjourned to March 28 at Boston, when further inquiries into the company's methods will be answered.

In the early part of Mr. Manson's testimony, he stated that he had been in the engineering service of the company for 39 years and chief engineer since 1912, holding virtually this post with the same duties since 1905. Principal duties of the chief engineer include responsibility for engineering policies and practices as to plant design, making inventories and appraisals, studying depreciation and compiling the budget.

The witness attended most of the hearings in the petitioners' side of the case, and has given much study to the testimony and exhibits of those seeking a rate reduction.

Dollars invested in plant do not represent a fair comparative measure of the quantity of plant built, Mr. Manson stated. The rebuttal of the testimony of Wycliffe C. Marshall, counsel for the Boston Central Labor Union, to the effect that the New England company overbuilt its plant was referred to in a previous report of these hearings in TELEPHONY.

In brief, the rapid plant expansion after 1920 was due to the necessity for meeting demands for service which piled up on account of the war, and at the then prevailing high costs of labor and material. Mr. Manson declared that the company gained 14,322 stations in 1930 despite the stock market crash of 1929, excluding purchased companies. There was no reason to think that the increase in stations was not going to continue.

In the year 1931, the company lost 1,921 stations and there were about two million less toll messages that year than in 1930, the greater dropping off starting in the last quarter. It was good business to complete the construction work carried over into 1931 from the two previous years, although the total for 1932 was about $17,700,000 against $32,700,000 in 1929. As late as 1925, all the company's resources had not enabled it to catch up with the post-war shortage of facilities.

All construction estimates are passed on by the chief engineer before they go to the executives for authorization; and on large projects like a new office, building or important toll cable, they reach him before coming to the estimate stage.

Provisional estimates of construction are made ahead of each year in the fall, and are reviewed from time to time. Consideration by the chief engineer involves determining their need, soundness of the engineering, kind of job to be done, quantity of work, and at times the financial and service advantages of the project.

Pole Line Investment Analyzed.

Mr. Manson contended that it is a fallacy to measure plant, built during periods of changing prices, by dollar investment yardsticks. The total pole-line investment increased 150 per cent from 1916 to 1931. Had this been a fair measure of the quantity of plant built, one would expect to find the same increase in pole line mileage, but this actually gained only 11 per cent.

Old poles were taken off at lower cost, and this, with the removal of certain line

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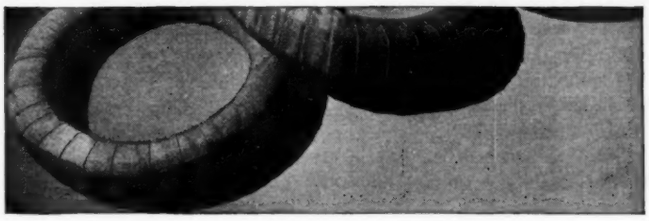

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mileage, increased the unit investment. Superseding old plant, put on the books at low prices by higher-priced plant, is bound to increase investment out of line with the increase in plant units.

Thus, a 30-foot class "B" chestnut pole in 1914 cost about $12, against $31 in 1931. If the first has to be replaced by the latter, the investment is more than doubled without any increase in plant units. Incidentally, the witness deprecated the use of pole-line statistics, on a per station basis, as potentially unsound.

The number of stations per exchange circuit fell from 2.12 in 1916 to 1.83 in 1931. Tabular data, presented by Mr. Manson on exchange circuit investment, was published in TELEPHONY of March 11. He stated that at the end of 1931, the company had about the same investment per exchange circuit in aerial cable and aerial wire, but a much better plant with a capacity for growth not available in 1925.

The newer plant is less susceptible to trouble and carries lower depreciation rates. The depreciation rate now being used (adopted January 1, 1933) for exchange aerial cable is 4.2 per cent and for open exchange wire, 7.4 per cent.

A large proportion of the exchange aerial wire is in twisted pair, which is in the drop wire account and is not subject to depreciation expense accounting, coming out of plant through operation of the station change and removal account.

Experience indicates an average life for the wire of eight years, so that the company has moved a long way toward using much less than formerly of a type of plant having a depreciation expense of about 12 per cent to a type with a little over 4 per cent of depreciation. To illustrate, 50 pairs of No. 24 gauge cable cost in place, roughly, 30 cents per foot. For that price one can buy about 10 pairs of twisted plant wire and get nowhere nearly as much plant capacity.

Cable involves much lower operating expense and less interruption to service than the wire plant, and this illustrates the fallacy of comparing quantities of plant on the basis of investment per circuit or per station. Cable prices since the war have shown a downward trend, but have not yet arrived at the pre-war level for either cable itself of cable in place.

Increasing Use of "Fine Wire" Cable.

In 1921 the company began to use No. 24 gauge cable in aerial plant. In 1916, 100 per cent of the cable in the exchange aerial plant was No. 22 gauge or larger. This weighed about 10 pounds per mile of wire, and the No. 19 gauge wire, just under 21 pounds. At the end of 1931, about 60.5 per cent of the exchange aerial cable wire was No. 22 gauge or over and the balance No. 24 gauge and No. 26 gauge. The No. 24 gauge weighs 6.5 pounds per mile and the No. 26, only 4 pounds. The overall effect of this change is that the average weight per mile of aerial exchange cable fell from 14.8 pounds in 1916 to 11.9 in 1931.

Cables are, therefore, smaller and sheaths less expensive, with a further saving in freight and handling charges. The development has come through the research work at the American Telephone & Telegraph Co. as applied by the New England company's engineers. It now appears as if the No. 19 gauge wire would gradually disappear, except for the longest lines, from the Central office.

Maintenance Continues.

It was necessary to spend almost $18,000,000 for construction in 1932 despite the falling off of stations. The company had certain commitments in large offices to complete. There would be no profit, Mr. Manson said, in failing to complete a project on which a large initial outlay had been made. The shifting telephone population necessitates much construction work; many power plant replacements have to be made at higher than pre-war costs, and pole decay is endless.

Replacement power plants must have capacity for future growth when indicated. Of last year's total construction of $18,000,000, from $7,000,000 to $8,000,000 were directly associated with service orders from subscribers. Road construction in New England forces the company to build temporary or permanent plant, regardless of general business conditions.

In 1916, the company had no long aerial toll cables between large centers. Underground toll cables were in service between Boston and various centers 25 to 50 miles away, and No. 16 gauge wire was possible in some of these on account of the development of loading coils. Repeaters were developed and in 1922, an aerial cable was installed between the Taunton and Fall River districts. This was followed two years later by an important toll cable between Boston and Portland (since extended to Lewiston and Bangor, Me.). Others have been built into New Hampshire and western Massachusetts.

The majority of these use No. 19 gauge wire, which is the size used for the longest toll connections to all parts of the United States as far west as Kansas City and Omaha. In some short runs, say 25 to 50 miles, it is cheaper to use No. 16 gauge wire without repeaters.

The effect of these developments has been greatly to reduce the weight of wire and to cut the cost per wire mile, especially where cables are substituted for open wire and the growth of business taken on cable circuits. More dependable and faster service has also resulted, through relative immunity from weather troubles and the provision of larger groups of circuits between points.

In the company's entire territory about 80 per cent of the stations are in offices connected to the solid toll cable network of the Bell System, and in Massachusetts, 95 per cent.

Between 1914 and 1931 the number of stations increased 58 per cent; the number of positions installed increased 27.6 per cent; the lines working increased 88 per cent, and the number of line equipments installed was 70.8 per cent greater. The multiple fill grew from 78 per cent to 85.4 per cent, a very good working efficiency. The investment of the company at the end of 1931 was 248.5 per cent greater than in 1914, reflecting the increase in equipment prices as well as growth.

The number of stations per position was 137 in 1914 and 170 in 1931; lines per position, 66 and 96, respectively, which shows the effect of regrading. The ratio of toll messages to total was 55.4 per cent in 1920 and 63.8 per cent in 1931.

The investment per station in manual central office equipment rose from $19.05 to $41.98 between 1914 and 1931, despite the use of the dial system in some of the largest offices and because of the higher prices of equipment and extension of toll plant. The use of modern equipment and improved technique have resulted in operating economies. Automatic power plant equipment for battery charging, for example, is good for the battery as well as economical from the standpoint of attendance.

Since 1916, the percentage of stations housed in company buildings has increased from 76.3 to 82.9. In recent years there has been a marked trend toward housing exchange offices in company-owned buildings, on account of the difficulties of finding adequate rented space for the large plant investment required, as well as proper fire protection even in small places.

Answers to the Traffic Questions Presented on Page 16.

1. Handling her toll calls by the CLR method results in a faster and more satisfactory service for her customers and saves the operators' time.
2. Refer the case to your chief operator. She will call the toll center chief operator and advise her of the kind of service that is being received from her office so that she may take the necessary action to correct the condition.
3. See introduction to this set of questions and answers.
4. If a call is transferred to another toll center and a chargeable report has been given, in passing the ticket to the new OTC TX, also pass the chargeable report and enter "no rept chg" in the "Report" space on your ticket. There is only one report charge on a call.
5. The toll operator cuts into the proper call circuit and says to the toll switching operator, for example, "LD trunk 23 return."

THE TIME HAS ARRIVED..

THE time has arrived when operating telephone companies must make a detailed study of their lines and plant in order to determine what maintenance, replacement and construction work must be done this Spring and Summer to keep their properties in an efficient operating condition.

For two years maintenance and replacement expenses have been drastically curtailed. As a consequence, with many companies, replacement needs are unusually large this year. This Spring the prices of telephone equipment and supplies are exceptionally low—and in many cases probably the lowest in the history of the industry. Labor is plentiful.

With these facts in mind it is reasonable to believe that the managements of most telephone companies recognize the opportunity offered for doing necessary work at minimum costs. They are endeavoring now to arrange to do a sizable portion of the deferred maintenance and rebuilding which must be done.

On April 8 TELEPHONY will publish its annual Spring Rebuilding and Construction Issue. Every telephone company will read with interest the articles in this number which will relate to their maintenance and rebuilding work. Practical methods used in rehabilitation will be described. It will be a highly important issue for every telephone operating man—watch for it!

TELEPHONY'S

Spring Rebuilding and Construction Issue will be dated

April 8

This throws out of line, comparisons based on building investment per station as presented by the petitioners. Before 1923, the company had no dial office buildings, and there is no evidence that a dial building as such increases the investment per station over $1 per instrument.

Dial System Economics and Service.

Mr. Marshall introduced criticisms of the company for installing the dial system, asserting that an enormous increase in plant costs had resulted as compared with the manual system. Mr. Manson declared in rebuttal that at the end of 1929, $40,000,000 would be a liberal figure for the total investment in dial central office equipment land and buildings out of a total plant increase since 1921 of $143,800,000. Heavy investment in manual equipment would have been necessary without the dial system so that, actually, the dial system is responsible for but a small percentage of the plant increase cost.

The petitioners claimed that the transition from manual central offices to machine switching in Massachusetts means an annual loss to the company of $824,000. Mr. Manson condemned these assertions as unsound and incorrect, declaring that Mr. Marshall appears to have compared the manual equipment and buildings and the investment in these at the time they were displaced by the dial system, with the investment in the dial equipment, land and buildings.

At the end of 1930, the company faced the choice of relieving manual equipment congestion either on a manual system extension basis or by adopting the dial system. It chose the latter. The dial equipment and buildings not only had a greater capacity built into them but they were actually serving more stations than the manual at the time of their relief and displacement. The average size of the dial office in 1930 was about 10,000 stations in Massachusetts against a manual station average of 2,500 stations.

Attempts to measure what operating costs would have been on a manual basis in 1930 if the new dial offices had instead been continued on a manual basis, by getting at the average traffic and maintenance costs of the remaining manual offices in the state, are misleading because of differences in the sizes, trunking and operating conditions of the compared offices. The majority of the dial stations are in the Boston district, with larger working exchanges and increased trunking.

It is impossible to compare the dial and manual systems by ignoring the increased investment necessary to take care of the growth on the old manual basis. About 320,000 stations were directly served from dial offices in 1931, but about 20 per cent of these stations are P. B. X. extensions which do not need dials.

Mr. Manson pointed out that in studying the traffic expenses the petitioners omitted $248,000 in 1930 for operators' wages in agency offices. There were 10,000 such stations in service. The witness stated that in 1930 the manual traffic expense in the Boston metropolitan area totaled $16 per station for 279,509 stations, and the average traffic expense per manual station in that year outside the Boston area for 362,810 stations was $8.86.

In 1930, the maintenance per average manual station in the Boston area was $2.62, and outside the Boston district, $1.35. Mr. Manson stated that about 85 per cent of the dial stations of the company are in Massachusetts, and asserted that in addition to the savings effected in operating labor by the dial system, improved technique in handling traffic, better transmission quality, restricted repetition of numbers to the calling subscriber, and straightforward trunking have been important sources of labor economy.

Mr. Manson believes that the company is at present making a profit from the operation of the dial system in comparison with what the cost would have been had it continued manual operation in the exchanges now dialed.

Nebraska Telephone Companies Protest Maximum Rate Bill.

Strong protests were lodged by the representatives of a dozen or more of the leading telephone companies in Nebraska against the adoption by the state legislature of the maximum rate law drafted by Floyd Bollen, newly-elected state railway commissioner, at a hearing held March 9 by the committee to which it had been referred.

John H. Agee, general manager for the Lincoln Telephone & Telegraph Co., said that as long as the state maintains a railway commission for the purpose of regulating rates of telephone companies, among other duties, legislation of the kind proposed is mere surplusage.

Legislative rate-fixing is likely to prove as disastrous to the patron as to the company, since it may very easily mean the difference between a company that is operating in the red and one that is operating in the black; one that is able to furnish adequate service to patrons and one that is not.

Mr. Agee insisted there is not any money in the telephone business. "In 1932," said he, "through the employment of the strictest economies, we got through and paid dividends and had $7,000 left on a 12 million dollar company. If things continue as they are at the present time, we can't pay dividends and must either ask higher rates or close some of our exchanges."

He was willing to go with Mr. Bollen if he could work out a plan that would reduce rates without putting companies into receiverships.

F. E. Randall, general counsel for the Northwestern Bell Telephone Co., said that the state had tried fixing maximum rates for utilities in the past, and had failed miserably. It had passed a law fixing maximum rates for railroads, and the law was held unconstitutional by the federal court in an opinion which laid down a rule that has decided many rate controversies since then.

It had passed, at the demand of the public, a law fixing two cents a mile for passengers carried within the state, and patrons have been paying 3.6 cents most of the time since, because the courts held the law confiscatory.

The same result is bound to follow any legislative rate-making, for the reason that it is usually the result of an effort to meet a clamorous demand, and the rates cannot stand up in court because they were not based on the factors that the courts have long held to control the reasonableness of any rate for public utilities and common carriers. Legislators do not have either the time, and often not the capacity, to study audits and inventories to justify conclusions.

Mr. Randall said that the law would be particularly unfortunate coming at this time. It would mean litigation that neither the companies nor the state have the inclination to enter upon, or excess funds with which to finance lawsuits.

Answering a declaration of Representative Tesar, one of the introducers, that he thought 5 per cent interest was enough for a utility to earn in these times Mr. Randall quoted figures for the last five years to show that the returns on the 25 million dollars' worth of property the company has in Nebraska averaged below 4 per cent. He said that if the company's valuation were cut in two and it was allowed 5 per cent on that figure, it would exactly equal the return now being earned.

Mr. Randall stated that commission regulation is universal, and it comes nearer holding the scales of justice even between companies and patrons than any other plan. He pointed out that the determination of the national government to inflate the currency will mean increased price levels, and the effect of the proposed legislation would put the commission in straightjackets. Figures for exchanges were submitted to show that toll earnings have been the biggest factor in keeping up returns.

Other telephone men said that rural rates, for a reduction in which the demand was greatest, have never been profitable, and that the farmers in almost any section could purchase any of the company's rural lines on long-time notes, and the companies would make more money switching them at the standard rate than they do now.

Commissioner Bollen defended the bill, saying it would not affect the smaller companies since they are well within the maxi-

mum, while the big companies were taking the attitude towards patrons of paying the present rate or leave it. He said all companies could operate under the maximum rates and pay dividends.

Former Senator Easton, of Omaha, said that the Northwestern Bell company appeared not to realize that a depression was on. It is maintaining rates at the old level and at the same time paying its officers high salaries.

E. A. Howard, of Omaha, a former Independent operator, said lower rates will keep for the company many patrons they are certain to lose if rates are maintained, and bring back many they have lost.

Nebraska Commission Seeks Quarterly Reports by Exchanges.

On motion of Commissioner Bollen, new member of the Nebraska railway regulatory body, all telephone companies operating in the state were cited to show cause on March 15 why an order should not issue compelling them to report for the year 1932 and every three months hereafter, beginning April 1, on assets, earnings and expenses of each exchange.

Mr. Bollen has recently been assigned, at his request, to the work of looking after telephone rate cases, service complaints and all other matters relating to regulation and supervision of telephone companies. The order was issued after representatives of the industry had protested against the expense and the lack of justification at this time, when no rate cases are on the docket and none contemplated.

None of them keeps its accounts segregated by exchanges, because of the cost and the fact that the necessary information can be readily obtained when necessary for use. Vigorous opposition to the final issuance of such an order was to be presented.

The object sought is to require each exchange account to be separately kept. The asset account shall show telephone plant in service, construction work in progress, materials and supplies on hand, receivables, cash, deposits and temporary cash investments and other assets.

The earnings account shall show exchange service revenues, toll service revenues (25 per cent), miscellaneous operating revenues, less uncollectible revenues, and the total revenues. Expense accounts are divided into traffic, commercial, operating rents, miscellaneous operating expenses, current maintenance and depreciation.

The third schedule required is the number of stations in service at the end of the quarter in all of the various classes of service, metallic and grounded, and number of switched stations.

The resolution adopted, prepared by Commissioner Bollen, recites these as the reasons for the order to show cause:

"Whereas, heretofore the commission has not required telephone companies operating two or more exchanges to report separately for each exchange on matters pertaining to valuations, revenues, expenses and number of subscribers, and,

Whereas, in all telephone rate cases the several companies operating in Nebraska have taken the position that each exchange operated by such company should stand by itself in all matters pertaining to valuations, revenues, expenses and number of subscribers, for rate making purposes, and,

Whereas, in order that the commission may function more efficiently in the interest of the public, and to assemble sufficient data to meet the inquiries of the public, it now appears not only desirable but necessary that such companies should report to the commission as of December 31, 1932, for the entire year of 1932, and quarterly thereafter commencing April 1, 1933, such matters as above set forth, and more specifically as set forth in exhibit A attached hereto."

Report Recommends Continuance of Nebraska Commission.

The special committee of the legislature assigned to investigate the Nebraska State Railway Commission in consideration of the fact that Governor Bryan had recommended that it be abolished in its present form and that to three executive state officers should be assigned the work it now does, has reported to the House that the commission is performing a very useful and necessary work and that it should be retained as at present.

One member, introducer of the bill, filed a minority report in which he claimed that the state would save the salary of the three commissioners; that the commission had perverted the objects of its creation and instead of being a regulatory body had become a court, and that no other body is less representative of the people.

The majority report set out that the state had, years ago, tried out the experiment of a state regulatory board made up of three executive state officers, and had abandoned it because of unsatisfactory results.

It finds that the public interest is best served by a continuing body, the personnel of which could not be entirely changed at one general election; that the nature and extent of the work performed is such that it could not be performed by three executive state officers; and that in any event there would be no saving of any amount worth considering since their present duties would take up the major part of their time, thus necessitating the employment of expert assistance.

The report gave a resume of the work performed by the commission in the years since it was created. It finds that every security authorized by the commission has been based on sound value and

(*Please turn to page 36.*)

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With the Manufacturers and Jobbers

School in Fort Wayne, Ind., Installs Kellogg P. B. X. Board.

The Fort Wayne State School for Boys recently installed a 100-line Kellogg P. B. X. switchboard. The school is located at Fort Wayne, Ind.

The new equipment was installed, due to a need for modern, fast telephone service.

New Catalog Issued by the Suttle Equipment Co.

The Suttle Equipment Co., of Lawrenceville, Ill., has recently issued its new catalog, listing the telephone equipment and supplies it has to offer to the telephone field. The first two pages of the catalog are devoted to an illustration of the company's attractive and well-equipped plant, and arrangements available to the customers for their convenience when placing orders.

The catalog is divided into sections as follows: Switchboard section, telephone section, Suttle re-manufacturing service, printing and office supply section, line materials and outside construction supplies, and tools and miscellaneous supplies.

Among the articles listed in the catalog are re-manufactured switchboards, having been given this name because it is stated that the steel and metal parts and the cabinet have been salvaged and refinished, but all the parts pertaining to the circuits are new. Re-manufactured switchboard replacement parts are listed, as well as operators' chairs, new and rebuilt; power equipment for magneto switchboards, cords for operators' sets, switchboard plugs, test sets and magnet chargers.

The telephone section is devoted to descriptions of rebuilt telephones as well as new ones, loud-ringing extension bells, magneto signal sets, extension bell boxes, extension desk stands, re-manufactured magneto telephone sets of various manufacturers, new receiver shells and caps, extension brackets, and telephone cabinets.

The section devoted to re-manufacturing thoroughly covers the products offered by the Suttle company, stressing its repair service for transmitters, receivers, ringers, generators, coil rewinding, and switchboards.

The printing and office supply section offers a varied choice of accounting systems and records, telephone accounting forms, collectors' report forms, employes' daily work reports, toll ticket forms, etc.

Many telephone companies will undoubtedly be interested in the section devoted to line materials and outside construction supplies. The miscellaneous tool section covers post hole diggers, cable rollers, shovels, cable chairs, pay-out reels, bolt cutters, pliers, wire-splicing connectors, etc.

A copy of the catalog may be obtained by writing the Suttle Equipment Co., Lawrenceville, Ill.

Nine More R-C-X's Ordered for Immediate Installation.

That telephone companies are showing far more than an academic interest in the Strowger R-C-X (remote-controlled exchange), developed for small rural exchanges, is indicated in the orders actually being placed for that type of equipment. H. L. Harris, president of American Automatic Electric Sales Co., reports that orders have been received during the last few weeks for nine R-C-X's. A few of these have already been installed, while the remainder are scheduled to be placed in operation very shortly.

Using the existing telephones, the same grounded or metallic lines, the same code-ringing methods as in the past, the R-C-X's free the operators at these points, it is stated, and enable the companies to render uniformly good, continuous, 24-hour service by means of a control circuit to a neighboring exchange.

Eight different companies placed these orders, which will be installed in seven states, indicating that interest in the new method is not confined to a single locality. The exchanges to be equipped include Kennard, Ind. (Knightstown Telephone Co.); Cedarville, Ill. (Northwestern Telephone Co.); Literberry, Ill. (Illinois Telephone Co.); Elderon, Wis. (Wittenberg Telephone Co.); Caroline, Wis. (Caroline Telephone Co.); Hollandale, Minn. (Hollandale Telephone Co.); Port Williams, Ohio (Clinton Telephone Co.); and Oakland, Ky., and Doyle, Tenn. (Southern Continental Telephone Co.).

Study Course in Selling for Employes; Supervision of Sales.

A new service is being offered to telephone companies. It provides for general supervision of service sales and the instruction of employes of telephone companies in service selling.

The service includes the furnishing of a course of study, "Telephone Service Sales and Telephone Problems," one lesson each week for a period of 52 weeks. The lessons each week are to be presented to and studied by the company employes in groups. The weekly lessons are supplemented by a monthly bulletin of an inspirational nature which also gives the competitive standing as regards sales of the companies subscribing to the sales course.

The companies make monthly reports covering the service sales made by the employes each month and the station loss or gain for the month previous. The information given in these reports is considered confidential and is used in percentages and not in actual figures in the monthly bulletins.

This new service is furnished by the Telephone Employe Sales Service, of which A. R. MacKinnon is director. Mr. MacKinnon is especially well qualified to direct a sales course of this nature. For two years—1930 and 1931—he was secretary of the Kansas Telephone Association at Topeka and made an especially good record. His work in building up and increasing the activities of the Kansas association was recognized by the Telephone Bond & Share Co., of Chicago, and he became director of its telephone service sales in the latter part of 1931.

A. R. MacKinnon, Director of the Telephone Employe Sales Service, Has Had Many Years' Experience in Selling in Addition to an Especially Varied Experience in Dealing With Telephone Problems.

His work with this organization, which owns and operates telephone properties in 17 states, so improved the sales ability of employes that other companies asked if some arrangement could be made by which they could be included in the instruction plan and benefit from the supervision of service sales.

As a result the Telephone Employe Sales Service has been organized by Mr. MacKinnon, whereby he handles the sales work of the Telephone Bond & Share Co. under contracts which are so drawn as to leave him free to be of assistance to the entire industry.

The sales course, as previously stated,

embodies 52 lessons, each of which takes up a different topic for discussion. The course of instruction is supplemented by inspirational monthly bulletins, while competition with other companies for prizes puts new life into employes and develops a company spirit in them that will be a satisfaction to the management, in addition to gaining back lost stations more rapidly.

Prior to his connection with the Kansas Telephone Association as secretary, Mr. MacKinnon had a number of years of experience in practical sales work. This, in connection with his telephone experience, enables him to produce and supervise a telephone sales course which is particularly adapted to telephone employes and selling.

Complete details of this telephone employe sales service may be obtained upon application to A. R. MacKinnon, director, Telephone Employe Sales Service, 19 S. La Salle St., Chicago, Ill.

Fire in Historic Ohio Exchange

Building in Adario, Ohio, in Which First Remote-Controlled Magneto Exchange Was Installed in 1924, Completely Destroyed by Fire—Exchange Part of System of Mansfield Telephone Co.

By R. C. Arter,
Chief Engineer, North Electric Mfg. Co.

A historical relic of past significance but still in efficient service and full of potential years ahead, came to an untimely end last week by fire at the rural town of Adario, Ohio, near Mansfield. The Adario exchange, installed in 1924, was the first remote-controlled magneto exchange.

It represented a mile-post between the first remote-controlled or "satellite" common-battery exchange erected by the North Electric Co. at Ashtabula in 1908, and the most modern remote-controlled common-battery exchange of the all-relay and other types which have been installed more recently.

The exchange equipment at Mansfield is well known by reason of the prominence and successful character of the company; the fact that it stands second in size among the Independent companies of Ohio, and its successful operation, through 15 years with a North automanual switchboard.

The town of Adario is a small rural community situated 16 miles from Mansfield, the telephone exchange being a part of the system of the Mansfield company. At the time of the installation of the remote-controlled exchange at Adario, the highways between the town and neighboring cities were in such poor condition as practically to isolate the town during considerable periods of the year.

The Adario exchange for years had exhibited the unprofitable results at the year-end usual in such small magneto exchanges. The improvement in the accounts of the Mansfield exchange, resulting from the installation of the automanual equipment in that exchange, encouraged the company to install an "automanual satellite" at Adario.

This it planned to operate over control trunks from the Mansfield exchange on the plan of the North common battery satellites which were already in rather common use. The economics of the Adario exchange, however, forbade replacing the existing magneto telephones, so plans were worked out for installing the automanual remote-controlled all-relay equipment in the magneto system with the magneto lines and station equipment unchanged.

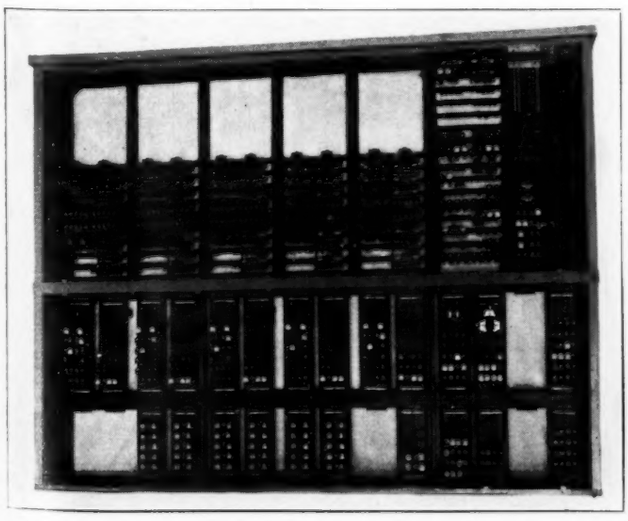
The Adario exchange comprised 40 lines, 127 stations; four trunks to Mansfield and one each to Ashland, Savannah, Greenwich and Shiloh. The magneto rural lines had 12-party code ringing station sets. The remote-controlled all-relay equipment was installed in a small unused residence, of which one room was rented for the switching apparatus.

As no commercial current was available, a local power plant was installed with a battery and a Delco engine-generator with what might be called semi-automatic control—the neighboring blacksmith put into the tank a gallon of gasoline and started the engine, which stopped and ceased the charging operation when the gasoline was all used. Circuit arrangements were made also by which the engine could be started from Mansfield over a trunk.

No voltage control of the battery was provided, since the all-relay equipment operates over wide ranges of voltage change. One 100-point step-by-step selector of the North type was provided to permit selection and testing of lines over the trunk from the wire chief's desk at Mansfield. Ringing current, code interruptions and tone currents were produced by Holtzer-Cabot ringing generators and rotating commutators driven from storage battery.

Control of the all-relay switching equipment at Adario, both for local and for trunk connections, was obtained over the trunk lines to Mansfield. These at the city end appeared among the regular distributed local traffic links in the Mansfield automanual exchange and were served by the regular automanual operators. An Adario subscriber on turning the substation generator became connected automatically over a trunk with an idle automanual operator at Mansfield who received the order for the wanted party exactly as she received all other incoming orders from local subscribers.

Thus the character of service extended to the subscribers at Adario was exactly the same as that furnished the Mansfield



The Magneto Remote-Controlled All Relay Exchange Equipment Installed in Adario, Ohio, Exchange in 1924—The Adario Exchange of the Mansfield Telephone Co., Which With Its Equipment Was Destroyed by Fire on March 6.

The mutual conductance of a tube can be easily measured using the circuit shown in Fig. 8. First adjust the plate voltage to the value for which it is designed. Then vary the grid voltage above and below the recommended value. The mutual conductance is equal to the plate-current change divided by the grid-voltage change.

For example, in testing an RCA-27 type tube we would set the plate-voltage at 180 volts, and then read the plate current with the grid voltage set at — 14.5 and — 13.5 volts.

In an actual test, a tube gave a plate-current reading of 5.0 milliamperes at — 13.5 volts and 4.0 milliamperes at — 14.5 volts.

$$g_m = \frac{dI_p}{dE_g} = \frac{0.005 - 0.004}{(-14.5) - (-13.5)} = 0.001 \text{ mho or } 1{,}000$$

micro-mhos.

Mutual conductance is usually expressed in micro-mhos, which is abbreviated "*u*mhos."

A micro-mho is one-millionth of a mho, and mhos may be converted to micro-mhos by multiplying by 10^6.

In Fig. 9, which shows the variation of mutual conductance that takes place with variations in plate current, and also the variation of plate resistance with variations in plate current, the mutual conductance curve, g_m, is the one which starts in the lower left corner and goes up towards the right. The plate resistance curve, r_p, starts in the upper left corner of Fig. 9 and curves downward to the right.

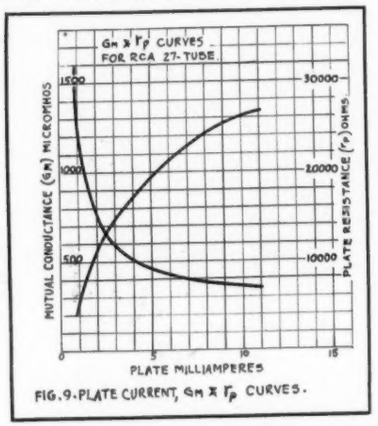


FIG. 9. PLATE CURRENT, Gm x rp CURVES.

It will be observed that the mutual conductance is quite low with low values of plate current but increases rapidly as the plate current is increased. Conversely, the plate resistance is quite high with low values of plate current, but falls to a much lower value as the plate current is increased.

The amount of power a vacuum tube can deliver to a load is increased as the mutual conductance is increased, or as the plate resistance is reduced. Tubes of the "screen grid type" have exceptionally high plate impedances (several hundred thousand ohms), while tubes of the "triode type" have much lower impedances (from 1,500 to 30,000 ohms).

Use of the Vacuum Tube as a Detector.

In connection with both radio broadcasting and carrier telephone communicating systems, the vacuum tube is used as a detector. An understanding of the theory of the vacuum tube used as a detector can best be obtained by considering its action in the reception of radio signals.

The radio waves which are radiated from the antennas of radio broadcasting stations, consist of a high-frequency

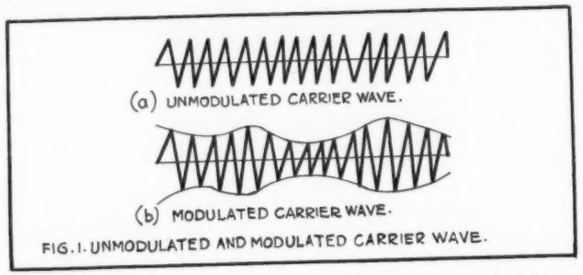
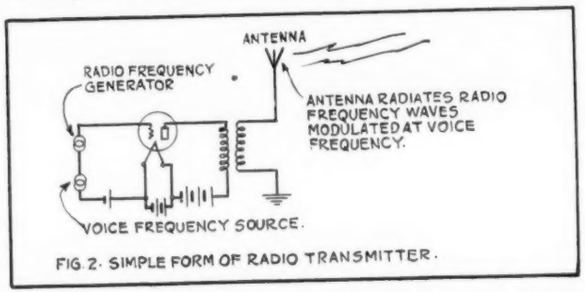


FIG. 1. UNMODULATED AND MODULATED CARRIER WAVE.

"carrier wave" that is varied (modulated) in amplitude at the frequency of the impressed voice or music (see Fig.. 1). This modulated wave, which is radiated from the antenna of a broadcasting station, is of such high frequency that it is inaudible to the human ear.

In order to convert the modulated high-frequency wave back into audible voice or music, it is necessary to utilize some form of rectifying device which will, in effect, separate the high, inaudible "carrier" frequency from the lower


ANTENNA
RADIO FREQUENCY GENERATOR
ANTENNA RADIATES RADIO FREQUENCY WAVES MODULATED AT VOICE FREQUENCY.
VOICE FREQUENCY SOURCE.
FIG. 2. SIMPLE FORM OF RADIO TRANSMITTER.

audible "voice" frequency. The vacuum tube is used for this purpose, and when so used is referred to as a "vacuum tube detector."

To differentiate between the use of the vacuum tube for the purpose of converting alternating current into direct current (for power purposes), and for the conversion of a modulated radio-frequency wave into an audible pulsating

current, the first use is referred to as "rectification." The tube when so used is known as a rectifier. The second use is termed "detection," and the tube is known as a detector.

While it is possible to use the three-element tube as a rectifying device, it is seldom so used, inasmuch as the two-element tube is better adapted to this purpose. However, for detection, the three-element or four-element tubes are much better suited than the two-element tube.

Theory of Detection; Plate-Circuit Detection.

Before discussing how a vacuum tube acts as a detector, we should first consider the basic principles of modulation. The term, "modulation," refers to the "molding" of a high-frequency carrier wave by means of voice-frequency current. Fig. 2 shows schematically a simple form of modulating system.

An ordinary three-element tube is used with the plate (output circuit) connected to the antenna by means of a transformer; and the grid (input circuit) is excited by two alternating current sources. One source is a generator operating at a frequency of 1,000,000 cycles, and the other an ordinary telephone with a frequency output which will vary from 200 to 3,000 cycles.

Consider first that the telephone is not being used and that the radio-frequency generator is impressing a voltage having a frequency of 1,000,000 cycles (1,000 kilocycles)

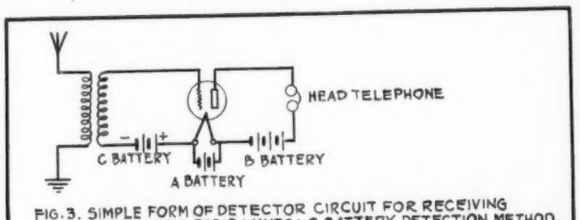


FIG. 3. SIMPLE FORM OF DETECTOR CIRCUIT FOR RECEIVING MODULATED RADIO WAVES; C BATTERY DETECTION METHOD.

across the grid of the tube; therefore, the plate circuit will have an exact replica, somewhat amplified in magnitude, of this frequency, which will be impressed upon the antenna system and will thus be radiated into space. The radiated wave would be uniform in peak value as indicated by curve *A* of Fig. 1.

If we now talk into the telephone transmitter, an alternating current voltage of voice frequency, in series with the potential from the radio-frequency generator, will be impressed on the grid of the tube. This superimposed audio frequency will alternately assist and oppose the high-frequency wave, with the result that the peak values are changed or modulated and the output wave will appear as shown in curve *B* of Fig. 1.

local subscribers. On getting an order for an Adario number, the Mansfield operator put down on her keys the Adario name and number; selection impulses were sent out from Mansfield to the Adario all-relay switching apparatus, which selected the wanted party in Adario and gave the ring with the proper code signal. Disconnection was performed either by the ring-off of one or both of the subscribers or, in case of failure to ring off, by a special time disconnect.

A feature unique in the automanual system of that time was the supervision afforded to the Adario subscribers in a special supervisory position in the Mansfield office. A rotational sequence-supervisory device located in the Adario office permitted the supervising operator at Mansfield when free of other duties to put a key in such position that supervisory signals of the Adario trunk lines in use were progressively displayed before the supervising operator in Mansfield. Thus any irregularity in the operation of the exchange, or any need of assistance in connection with existing conversations, could be given personal attention.

In the cases of calls from the Adario subscribers for connections with Mansfield local subscribers, the Mansfield operator put down upon her keyboard the regular Mansfield subscribers' numbers; the Mansfield switching apparatus connected automatically with the Adario trunk and completed connections from the trunk to the wanted Mansfield subscribers. As the traffic from Adario to Mansfield was of considerable volume, this switching service offered substantial advantages to the Adario subscribers.

In case of calls from the Adario subscribers for any of the five nearby towns served by direct trunks from Adario, the operator pressed down office name and number keys corresponding with the wanted subscriber, by which the Adario switching apparatus was caused to select a trunk to the desired town where an operator received the call and completed it in the manual exchange.

Provision was made also for "rapid-fire toll" service for the Adario subscribers to other cities in the region; such calls when received by the Mansfield operator were set up directly on the Mansfield keyset and routed to the rapid-fire trunk lines at the distant town. By these methods 20 towns in the vicinity could be reached in a few seconds without the interference of any other operator than the Mansfield automanual operator.

This use of the automanual selecting apparatus for rapid-fire toll service was also, it is believed, the first example of this sort of service, and actually preceded the well known CLR toll service which is now in general use.

Then, as now, a principal objection raised by the skeptical to the remote-control method of operating automatic exchanges was the liability to failure of the control trunks. The Adario exchange was furnished with a manual keyboard desk which in emergency could be put into direct control of the Adario system for making local and trunk connections, by merely plugging into the desk an operator's head telephone in the same way in which the ordinary automanual desks are put into service as required.

True to the slogan of its kind, the Adario all-relay exchange endured through its whole life, dust and damp, winter's cold and summer's heat, in its uninterrupted, lonely incarceration in a region not conveniently accessible through considerable parts of the years to maintainence men from Mansfield or Shiloh.

Superintendent of Equipment Lisle, of the Mansfield company, states that all cases of trouble in the all-relay switching equipment have averaged not to exceed one per year, with a best record for the last 18 months of no trouble whatever; the rather complicated all-relay terminal apparatus for both ends of all the trunks has shown no trouble whatever and has received no maintenance attention in the eight years of service; no repair parts of any kind for the all-relay equipment have been provided, used or required throughout its life.

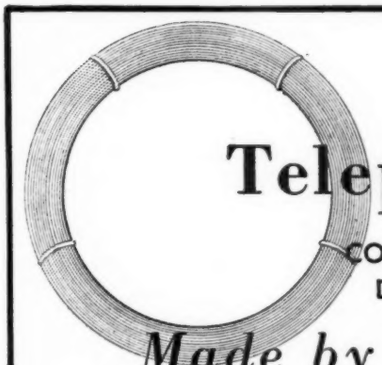
A certain amount of attention and a few repair parts have been required by the power-driven ringing generators and interruptors. In later exchanges, these rotating generators and interrupters have been eliminated, their functions being taken by relay devices.

The Adario all-relay remote-controlled magneto equipment for years has been a curiosity of great interest to telephone men. It has been visited and examined by many engineers from the United States, Europe, Australia and Asia.

In its end it was a victim of no defect of its own but of its unfortunate environment. The residence, once occupied by the family operating the manual telephone exchange, but long vacant, was about to be used again as a dwelling; a fire was built in the heating stove which during the night set fire to the building and destroyed it.

The telephone industry affords little time for sentiment and obituary ceremony; it is a case of "The King is Dead! Long Live the King!" The Mansfield company immediately placed an order with the North company for a new all-relay equipment, this time arranged for dial operation.

In the eight-year interval since the installation of the remote-controlled equipment in 1924, the all-relay exchange has been perfected in features which permit its operation over any lines capable of fairly good operation by a magneto system, the dials being able to work over any line over which satisfactory ringing can be performed. The new equipment will thus be free from even the moderate expense of traffic handling in the Mansfield automanual switchboard.



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WHAT THE COURTS AND COMMISSIONS ARE DOING

(*Concluded from page* 31.)

that no investor in them has lost a cent, either in principal or interest. Since the downward trend in costs more than 60 general rate structures of telephone companies have been revised downward by the commission. The report says that the commission, on the whole, has handled the cases involving telephone companies in a creditable manner.

The report goes also into the activities of the commission as representative of the interests of the shippers before the Interstate Commerce Commission, and cites savings of millions in reductions in rates covering largely agricultural products.

Although Governor Bryan was asked to give his reasons for his recommendations, he sent no communication to the committee. It held several open meetings at which the public was invited to appear, but no one presented himself to support the abolition proposal.

The feeling against the commission among legislators has noticeably abated, and while the senate appears hostile, the house refused to agree to a senate bill that cut the salaries of members from $5,000 to $3,000 but put it at $3,600.

The commission records show that in the last five years the commission has passed upon rate applications of telephone companies to the number of 168. Of this number 94 were requests for increased rates. In 42 of these cases hearings were held and increases denied in 12 instances.

In the 52 cases where no hearings were held and increases were granted, subscribers had by petition or in other ways, either consented to the increase or asked for it, and agreed to pay the rates the companies asked for, so that these were not, in fact, fixed by the commission.

These cases covered those where an improved type of service was promised, and in 40 of them, petitions signed by from 60 to 95 per cent of the patrons were presented. In most cases more than 80 per cent of the subscribers signed the petitions. In the other applications, commission audits showed the companies were losing money.

More than half of these increases were in 1928 and 1929, when prosperous times prevailed, and none has been asked or granted since the summer of 1931. By years the applications for increases were 1928, 23; 1929, 36; 1930, 26, and in 1931, 8.

In the same five-year period 69 applications for reductions in rates were approved without hearings, and upon showing or request of the companies, while five were dismissed or withdrawn, two being later refiled and included in the total. Only one of these dated back to 1928. There was one application for a reduction in 1930 and six in 1931. Twenty-one have been filed in the last two months, the first two of the current year, while 36 were filed in 1932.

The reductions are almost entirely confined to mutuals either in form or in fact through wide ownership of stock among patrons. Others are small stock companies or community enterprises that desire to keep the good will of the farmers in the adjacent trade territory. None has come from the larger companies with a considerable number of exchanges, but several with two or four have asked for concessions in the matter of larger discounts or waiving of installation charges.

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Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

February 25: New York Telephone Co. granted authority to purchase the physical properties of the Salisbury Telephone Co., Inc., operating in Salisbury Center, N. Y.

February 27: Order issued approving acquisition by the Mountain States Telephone & Telegraph Co. of the properties of George B. Holden, operating as the Ward Telephone Co., in the village of Ward, Boulder county, Colorado.

MASSACHUSETTS.

March 28: Continued hearing in Boston in rate investigation of the New England Telephone & Telegraph Co.

MISSOURI.

February 27: Complaint filed by L. E. Daugherty, et al. against the Western Telephone Corp. asking reduced rates at Creighton.

February 27: Complaint filed by J. N. Otis, against the United Telephone Co., asking reduced rates at Hopkins.

February 27: In regard to application of the Scotia Telephone Co., for permission to file a new schedule of rates for telephone service at Union, the following monthly rates have been approved, effective April 1: Business, one-party, $3.00; business, two-party, $2.50; business, extension, $1.00; residence, one-party, $1.90; residence, two-party, $1.40; residence, extension, 50 cents.

NEW YORK.

March 16: Continued hearing on motion of the commission as to rules and regulations of the New York Telephone Co.

NEBRASKA.

March 4: Application filed by Farmers' Cooperative Telephone Association, of Louisville, asking for authority to publish a rate of $1.00 a month to all subscribers, effective March 1; authority granted as requested without hearing.

March 4: In the matter of the application of the Craig Telephone Co. for authority to reduce rates; ordered that effective for one year from March 1, 1933, the company be authorized to publish these net rates: Business, individual and two-party, $1.25; business, three-party and over, $1.00; residence, individual, $1.25; residence, two-party and over, $1.00; farm lines, $1.00; extension bells, 25 cents; extension sets, 50 cents.

March 4: In the matter of the application of the Western Telephone Corp., with headquarters at Dennison, Iowa, for authority to waive the collection of all move and installation charges where wiring is in place from March 1 to May 1; granted.

March 4: In the matter of the application of the Cedar County Farmers' Telephone Co. for authority to waive collection of all installation charges where wiring is in place; granted as asked for, waiver to be effective for one year.

March 4: In the matter of the application of the Ulysses Telephone Co. for authority to waive the collection of all installation and lapse of service charges for a period of one year from February 24, 1933, to February 24, 1934; granted.

March 8: In the matter of the application of the Crownover Telephone Co., of Sargent, for authority to offer a two-party business rate of $2.75 net; granted as asked.

OHIO.

February 28: Authority granted the Ohio Standard Telephone Co., which operates 76 exchanges, mostly in southern and southeastern Ohio, to extend to next December 31, its temporary arrangements for monthly billings. Previously the concern had been billing quarterly. The temporary authority to bill monthly would have expired April 1.

March 22: Hearing by order of the commission, at which the Ohio Bell Telephone Co. and the Cincinnati & Suburban Bell Telephone Co. must appear to show authority for the extra charge of 25 cents for the cradle-type telephones.

March 30: Hearing in rate case affecting the Newark Telephone Co. and the Ohio Central Telephone Co. The hearing will be on the complaint of the Licking County Pomona Grange No. 60, which seeks a rate reduction from the present $6 to $4 a quarter.

OKLAHOMA.

March 16: Hearing on application of the Nicoma Park & Choctaw Telephone Co. for permission to discontinue furnishing free trunk line service, etc.

March 21: Hearing in general investigation of rates, joint rates, tolls, etc., relating to telephone service.

WISCONSIN.

March 14: Hearing in Madison on rates of the Reedsburg Telephone Co.

March 20: Continued hearing in statewide investigation of rates and practices of the Wisconsin Telephone Co.

March 20: Hearing at Madison on order of the commission, citing the Wisconsin Telephone Co. to explain why it should not be prevented from making further improvements and extensions.